

SN 10/637608

**WHAT IS CLAIMED IS:**

1. A hydrogen composition comprising:  
hydrogen gas; and  
an odorant, said odorant having a vapor pressure greater than 0.5 psi, having a smell detectable at less than 1 ppm by a human nose, and being in a vapor phase at detectable concentration at a pressure of 6000 psi.
2. The composition of claim 1, wherein said odorant is a selenium compound.
3. The composition of claim 2, wherein said selenium compound is ethylselenol.
4. The composition of claim 2, wherein said selenium compound is dimethylselenol.
5. The composition of claim 1, wherein said odorant is methylamine.
6. The composition of claim 1, wherein said odorant is trimethylamine.
7. The composition of claim 1, wherein said gaseous composition consists essentially of hydrogen gas and said odorant.
8. The composition of claim 1, wherein said odorant comprises 0.01 to 1000 ppm of said composition.
9. The composition of claim 1, wherein said odorant comprises 0.1 to 40 ppm of said composition.
10. The composition of claim 1, wherein said odorant is not harmful to humans.
11. The composition of claim 7, wherein said odorant has a minimum olfactory power of 7.0, a minimum vapor pressure of 0.5 psi at standard temperature and pressure, a minimum diffusivity of  $0.01147 \text{ cm}^2/\text{s}$ , and a maximum molecular weight of 200 g/mol.

12. The composition of claim 1, wherein said odorant is an oxygen compound.

13. The composition of claim 1, wherein said odorant is a nitrogen compound.

14. The composition of claim 1, wherein said odorant is a sulfur compound.

15. A method for detecting a hydrogen gas leak from a container comprising:  
providing a container containing a hydrogen composition; and  
detecting a leak from said container when the smell of an odorant present in said hydrogen composition is sensed, wherein said hydrogen composition comprises hydrogen and said odorant, said odorant having a vapor pressure greater than 0.5 psi, having a smell detectable at less than 1 ppm by a human nose, and being in a vapor phase at detectable concentration at a pressure of 6000 psi.

16. The method of claim 15, wherein said odorant is a selenium compound.

17. The method of claim 16, wherein said selenium compound is ethylselenol.

18. The method of claim 16, wherein said selenium compound is dimethylselenol.

19. The method of claim 15, wherein said odorant is methylamine.

20. The method of claim 15, wherein said odorant is trimethylamine.

21. The method of claim 15, wherein said gaseous composition consists essentially of hydrogen gas and said odorant.

22. The method of claim 15, wherein said odorant comprises 0.01 to 1000 ppm of said composition.

23. The method of claim 15, wherein said odorant comprises 0.1 to 40 ppm of said composition.

24. The method of claim 15, wherein said odorant is not harmful to humans.

\$%^ST;HighlightOn= \*\*\*;HighlightOff=\*\*\* ;  
=> d his

FILE 'REGISTRY'

E HYDROGEN/CN

L1 1 S E3

FILE 'HCA'

L2 290162 S L1

L3 242040 S H2 OR (HYDROGEN# OR H) (2A) (GAS## OR GASEOUS? OR GASIF?

FILE 'REGISTRY'

L4 119831 S SE/ELS

E ETHYLSELENOL/CN

L5 1 S E3

E DIMETHYLSELENOL/CN

E DIMETHYL SELENOL/CN

E DIMETHANESELENOL/CN

FILE 'HCAPLUS'

L6 4382 S FLYNN ?/AU

L7 1593 S SPRAGUE ?/AU

L8 4 S L6 AND L7

SEL L8 1-4 RN

FILE 'REGISTRY'

L9 24 S E1-E24

L10 10 S L9 AND L4

E METHYLAMINE/CN

L11 1 S E3

E TRIMETHYLAMINE/CN

L12 1 S E3

FILE 'HCA'

L13 162659 S L4

L14 60730 S L5 OR L10 OR ETHYLSELENOL# OR ETHANESELENOL# OR DIMETHY

L15 45453 S L11 OR L12 OR METHYLAMINE# OR TRIMETHYLAMINE# OR ME3N

L16 101 S L5 OR ETHYLSELENOL# OR ETHANESELENOL# OR DIMETHYLSELENO

E OXYGEN COMPOUNDS/CV

E OXYGEN CONTAINING COMPOUNDS/CV

E OXYGEN/CV

E E3+ALL

L17 14010 S (OXYGENA? OR (OXYGEN# OR O2 OR O) (2A) (CONTAIN? OR CONTG

L18 18259 S (NITROGENA? OR (NITROGEN# OR N2 OR N) (2A) (CONTAIN? OR C

L19 15287 S ((SULFUR# OR S) (2A) (CONTAIN? OR CONTG#)) (3A) (MATERIAL?

L20 4160 S ODOR!NT?

FILE 'REGISTRY'

E SULFUR/CN

L21 1 S E3

E OXYGEN/CN

L22 1 S E3

E NITROGEN/CN

L23 1 S E3

FILE 'HCA'

L24 10252 S L21/D

L25 28059 S L22/D

L26 9672 S L23/D

L27 2919 S (L2 OR L3) AND L13

L28 1 S L27 AND L20

L29 148070 S (FRAGRAN? OR PERFUM? OR PARFUM? OR COLOGNE? OR ODOR? OR

=> file reg  
FILE 'REGISTRY'  
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
COPYRIGHT (C) 2004 American Chemical Society (ACS)

=> display history full 11-

FILE 'REGISTRY'  
L1 E HYDROGEN/CN  
1 SEA HYDROGEN/CN

FILE 'HCA'  
L2 290162 SEA L1  
L3 242040 SEA H2 OR (HYDROGEN# OR H) (2A) (GAS## OR GASEOUS? OR  
GASIF? OR ATMOS? OR ATM#)

FILE 'REGISTRY'  
L4 119831 SEA SE/ELS  
E ETHYLSELENOL/CN  
L5 1 SEA ETHYLSELENOL/CN  
E DIMETHYLSELENOL/CN  
E DIMETHYL SELENOL/CN  
E DIMETHANESELENOL/CN

FILE 'HCAPLUS'  
L6 4382 SEA FLYNN ?/AU  
L7 1593 SEA SPRAGUE ?/AU  
L8 4 SEA L6 AND L7  
SEL L8 1-4 RN

FILE 'REGISTRY'  
L9 24 SEA (1333-74-0/BI OR 107-10-8/BI OR 124-40-3/BI OR  
L10 10 SEA L9 AND L4  
E METHYLAMINE/CN  
L11 1 SEA METHYLAMINE/CN  
E TRIMETHYLAMINE/CN  
L12 1 SEA TRIMETHYLAMINE/CN

FILE 'HCA'  
L13 162659 SEA L4  
L14 60730 SEA L5 OR L10 OR ETHYLSELENOL# OR ETHANESELENOL# OR  
DIMETHYLSELENOL#  
L15 45453 SEA L11 OR L12 OR METHYLAMINE# OR TRIMETHYLAMINE# OR  
ME3N  
L16 101 SEA L5 OR ETHYLSELENOL# OR ETHANESELENOL# OR DIMETHYLSELE

NOL#  
E OXYGEN COMPOUNDS/CV  
E OXYGEN CONTAINING COMPOUNDS/CV  
E OXYGEN/CV  
E E3+ALL  
L17 14010 SEA (OXYGENA? OR (OXYGEN# OR O2 OR O) (2A) (CONTAIN? OR  
CONTG#)) (3A) (MATERIAL? OR COMPOUND# OR COMPD# OR CMPD#  
OR CPD#)  
L18 18259 SEA (NITROGENA? OR (NITROGEN# OR N2 OR N) (2A) (CONTAIN?  
OR CONTG#)) (3A) (MATERIAL? OR COMPOUND# OR COMPD# OR  
CMPD# OR CPD#)  
L19 15287 SEA ((SULFUR# OR S) (2A) (CONTAIN? OR CONTG#)) (3A) (MATERIAL  
? OR COMPOUND# OR COMPD# OR CMPD# OR CPD#)  
L20 4160 SEA ODOR!NT?

## FILE 'REGISTRY'

E SULFUR/CN  
L21 1 SEA SULFUR/CN  
E OXYGEN/CN  
L22 1 SEA OXYGEN/CN  
E NITROGEN/CN  
L23 1 SEA NITROGEN/CN

## FILE 'HCA'

L24 10252 SEA L21/D  
L25 28059 SEA L22/D  
L26 9672 SEA L23/D  
L27 2919 SEA (L2 OR L3) AND L13  
L28 1 SEA L27 AND L20  
L29 148070 SEA (FRAGRAN? OR PERFUM? OR PARFUM? OR COLOGNE? OR ODOR?  
OR AROMA# OR SMELL? OR SCENT? OR OLFACT? OR REDOLENT? OR  
ESSENCE? OR BOUQUET? OR AMBROS? OR ORGANOLEP?)/BI,AB  
L30 11 SEA L27 AND L29  
L31 1261 SEA (L2 OR L3) AND L14  
L32 1 SEA L31 AND L20  
L33 8 SEA L31 AND L29  
L34 1546 SEA (L2 OR L3) AND L15  
L35 4 SEA L34 AND L20  
L36 35 SEA L34 AND L29  
L37 3 SEA (L2 OR L3) AND L16  
L38 1681 SEA (L2 OR L3) AND (L17 OR L25)  
L39 986 SEA (L2 OR L3) AND (L18 OR L26)  
L40 1198 SEA (L2 OR L3) AND (L19 OR L24)  
L41 1 SEA L38 AND L20  
L42 1 SEA L39 AND L20  
L43 3 SEA L40 AND L20  
L44 13 SEA L38 AND L29  
L45 7 SEA L39 AND L29

L46 26 SEA L40 AND L29  
L47 84081 SEA FUEL? (2A) GAS##  
L48 89597 SEA FUEL? (2A) (CELL OR CELLS) OR (HYDROGEN# OR H2 OR  
H) (2A) (CELL OR CELLS OR FUEL? OR STORE# OR STORING# OR  
STORAG?)  
L49 122424 SEA SAFETY  
L50 6 SEA (L36 OR L44 OR L46) AND (L47 OR L48)  
L51 3 SEA (L36 OR L44 OR L46) AND L49  
L52 24 SEA L28 OR L32 OR L33 OR L35 OR L37 OR L41 OR L42 OR L43  
OR L45 OR L50 OR L51  
L53 13 SEA (L30 OR L44) NOT L52  
L54 47 SEA (L36 OR L46) NOT (L52 OR L53)

=> file hca

FILE 'HCA'

USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.

PLEASE SEE "HELP USAGETERMS" FOR DETAILS.

COPYRIGHT (C) 2004 AMERICAN CHEMICAL SOCIETY (ACS)

=> d l52 1-24 cbib abs hitstr hitind

L52 ANSWER 1 OF 24 HCA COPYRIGHT 2004 ACS on STN  
140:149105 Hydrogen **odorants** and **odorant** selection  
methods with regard to **safety** improvement of  
**hydrogen fuel**. Flynn, Patrick; Sprague, Michael  
(USA). U.S. Pat. Appl. Publ. US 2004031314 A1 20040219, 32 pp.  
(English). CODEN: USXXCO. APPLICATION: US 2003-637608 20030811.  
PRIORITY: US 2002-PV402664 20020813.

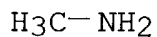
AB The present invention provides a method for evaluating the  
properties of hydrogen to improve the **safety** of  
**hydrogen fuel**, and provides a method for selecting  
proper **odorants** for hydrogen. **Odorized** hydrogen  
contg. suitable **odorants** in appropriate concns. with  
hydrogen are also provided.

IT 74-89-5, Methylamine, uses 75-50-3,  
Trimethylamine, uses 593-69-1,  
Ethylselenol 593-79-3, Dimethylselenide  
627-53-2, Diethyl selenide 7704-34-9D, Sulfur,  
compd. 7727-37-9D, Nitrogen, compd. 7782-44-7D,  
Oxygen, compd. 7782-49-2D, Selenium, compd.  
29035-18-5, Propaneselenol 29749-04-0, Isopropyl  
selenol 34172-59-3, tert-Butyl selenol 37773-04-9  
, Ethylmethyl selenide 42423-19-8, Selenonium, dimethyl-  
62037-00-7, Isopropyl methyl selenide  
(hydrogen **odorants** and **odorant** selection

methods with regard to **safety** improvement of  
**hydrogen fuel**)

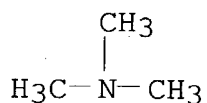
RN 74-89-5 HCA

CN Methanamine (9CI) (CA INDEX NAME)



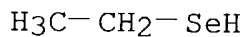
RN 75-50-3 HCA

CN Methanamine, N,N-dimethyl- (9CI) (CA INDEX NAME)



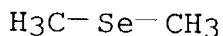
RN 593-69-1 HCA

CN Ethaneselenol (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



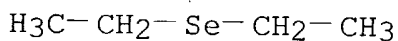
RN 593-79-3 HCA

CN Methane, selenobis- (9CI) (CA INDEX NAME)



RN 627-53-2 HCA

CN Ethane, 1,1'-selenobis- (9CI) (CA INDEX NAME)



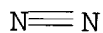
RN 7704-34-9 HCA

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

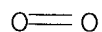
RN 7727-37-9 HCA

CN Nitrogen (8CI, 9CI) (CA INDEX NAME)



RN 7782-44-7 HCA

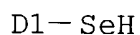
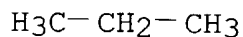
CN Oxygen (8CI, 9CI) (CA INDEX NAME)



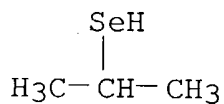
RN 7782-49-2 HCA  
CN Selenium (8CI, 9CI) (CA INDEX NAME)

Se

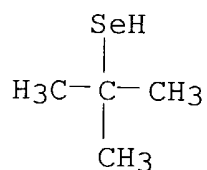
RN 29035-18-5 HCA  
CN Propaneselenol (8CI, 9CI) (CA INDEX NAME)



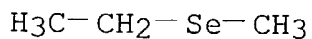
RN 29749-04-0 HCA  
CN 2-Propaneselenol (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 34172-59-3 HCA  
CN 2-Propaneselenol, 2-methyl- (8CI, 9CI) (CA INDEX NAME)

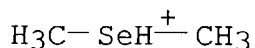


RN 37773-04-9 HCA  
CN Ethane, (methylseleno)- (9CI) (CA INDEX NAME)

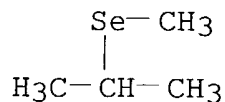


RN 42423-19-8 HCA  
CN Selenonium, dimethyl- (9CI) (CA INDEX NAME)





RN 62037-00-7 HCA  
 CN Propane, 2-(methylseleno)- (9CI) (CA INDEX NAME)



IT 1333-74-0, Hydrogen, uses  
 (hydrogen **odorants** and **odorant** selection  
 methods with regard to **safety** improvement of  
**hydrogen fuel**)  
 RN 1333-74-0 HCA  
 CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

IC ICM G01M003-20  
 ICS C09K003-00  
 NCL 073040700; 252372000; 073023340; 252408100  
 CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST **safety** improvement **hydrogen fuel**  
**odorant** selection  
 IT **Fuel gases**  
 Odor and Odorous substances  
**Safety**  
 (hydrogen **odorants** and **odorant**  
 selection methods with regard to **safety** improvement of  
**hydrogen fuel**)  
 IT 74-89-5, Methylamine, uses 75-04-7, Ethyl amine,  
 uses 75-50-3, Trimethylamine, uses 107-10-8,  
 Propylamine, uses 124-40-3, Dimethylamine, uses 140-88-5, Ethyl  
 acrylate 431-03-8, 2,3-Butanedione 593-69-1,  
**Ethylselenol** 593-79-3, Dimethylselenide  
 624-78-2, Ethylmethyl amine 627-53-2, Diethyl selenide  
 7704-34-9D, Sulfur, compd. 7727-37-9D, Nitrogen,  
 compd. 7782-44-7D, Oxygen, compd. 7782-49-2D,  
 Selenium, compd. 29035-18-5, Propaneselenol  
 29749-04-0, Isopropyl selenol 34172-59-3,  
 tert-Butyl selenol 37773-04-9, Ethylmethyl selenide  
 42423-19-8, Selenonium, dimethyl- 62037-00-7,  
 Isopropyl methyl selenide

(hydrogen **odorants** and **odorant** selection methods with regard to **safety** improvement of **hydrogen fuel**)

IT 1333-74-0, Hydrogen, uses  
(hydrogen **odorants** and **odorant** selection methods with regard to **safety** improvement of **hydrogen fuel**)

L52 ANSWER 2 OF 24 HCA COPYRIGHT 2004 ACS on STN

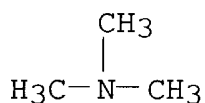
138:140543 Manufacture of grain-oriented electrotechnical steel sheets. Takashima, Minoru; Toge, Tetsuo; Hayakawa, Yasuyuki; Kurosawa, Mitsumasa; Komatsubara, Michiro (Kawasaki Steel Corp., Japan). Eur. Pat. Appl. EP 1281778 A2 20030205, 21 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK. (English). CODEN: EPXXDW. APPLICATION: EP 2002-17413 20020802. PRIORITY: JP 2001-234948 20010802; JP 2001-237390 20010806.

AB In the method, the secondary recrystn. and forsterite coating formation on the rolled sheets of steel comprising Si  $\leq 4.5$  and C 0.01-0.1%, are sepd.: first batch annealing for developing secondary recrystn. and second batch annealing for forming a forsterite coating, with continuous annealing performed between these two steps of batch annealing. In one embodiment, a steel slab comprising C 0.04, Si 3.0, Mn 0.08, Sb 0.02%, and Se 200 ppm, was heated to 1420°, hot rolled to the thickness of 2.0 mm, annealed at 1000° for 30 s, cold rolled to a thickness of 0.60 mm, subjected to intermediate annealing at 90° for 30 s, and cold rolled again to a final thickness of 0.22 mm. Subsequently, the primary-recrystn. continuous annealing at 850-1050° for 1-20 min in humid H<sub>2</sub>-N<sub>2</sub> atmosphere, first batch annealing at 875°, 100 h in N<sub>2</sub> atmosphere, intermediate continuous annealing (850-1100°, 2 min), and second (finishing) batch annealing at 1220° for 5 h were **perfumed**. An annealing separator comprising magnesia 95% and titania 5% was coated over the steel sheet surface before the second (finishing) batch annealing. After final coating in a soln. contg. phosphate, chromic acid, and colloidal silica at a wt. ratio of 3:1:3, backing annealing, and performing strain releasing annealing at 800° for 3 h, a magnetic induction B<sub>8</sub> of 1.90-1.92 T was produced. The method provides grain-oriented electrotech. steel sheets that is superior in both magnetic characteristics and coating characteristics.

IT 7782-49-2, Selenium, uses  
(microalloy; manuf. of grain-oriented electrotech. steel sheets)  
RN 7782-49-2 HCA  
CN Selenium (8CI, 9CI) (CA INDEX NAME)

Se

- IC ICM C21D008-12  
ICS C22C038-02
- CC 55-5 (Ferrous Metals and Alloys)  
Section cross-reference(s): 77
- IT 7440-31-5, Tin, uses 7440-36-0, Antimony, uses 7440-69-9,  
Bismuth, uses 7782-49-2, Selenium, uses  
(microalloy; manuf. of grain-oriented electrotech. steel sheets)
- L52 ANSWER 3 OF 24 HCA COPYRIGHT 2004 ACS on STN  
136:357516 Fuel processing system using improved feedstock. Edlund,  
David J. (Idatech, LLC, USA). PCT Int. Appl. WO 2002038265 A1  
20020516, 22 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ,  
BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ,  
EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG,  
KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX,  
MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM,  
TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD,  
RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES,  
FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD,  
TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-US51132  
20011102. PRIORITY: US 2000-PV248236 20001113.
- AB Disclosed are an improved feedstock for fuel processing systems, and  
fuel processing systems incorporating the same. The fuel processing  
system includes a fuel processor adapted to produce a product  
hydrogen stream from a carbon-contg. feedstock. The fuel processing  
system may also include a **fuel cell** stack  
adapted to produce an elec. current from the product hydrogen  
stream. The feedstock is at least substantially formed of a  
hydrogen stream. The feedstock is at least substantially formed of  
a hydrocarbon or alc. In an exemplary embodiment, the feedstock  
includes methanol. The feedstock also includes at least one  
**odorant** adapted to produce a strong and characteristic  
**odor**, even when present in only low concns. The  
**odorant**, or **odorants**, are selected to be free or  
at least sufficiently free from compds. that will poison the  
catalyst used in the fuel processor.
- IT 75-50-3, **Trimethylamine**, uses  
(fuel processing system using improved feedstock)
- RN 75-50-3 HCA
- CN Methanamine, N,N-dimethyl- (9CI) (CA INDEX NAME)



IT 1333-74-0P, **Hydrogen**, uses  
(**fuel** processing system using improved feedstock)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

IC B01J008-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **fuel cell fuel** processing system  
improved feedstock use

IT Membranes, nonbiological  
(H-permeable; **fuel** processing system using  
improved feedstock)

IT **Fuel cells**  
Methanation catalysts  
**Odor** and **Odorous** substances  
Reforming catalysts  
(**fuel** processing system using improved feedstock)

IT **Fuel gas** manufacturing  
(reforming; **fuel** processing system using improved  
feedstock)

IT Palladium alloy, base  
(H-permeable membrane; **fuel** processing system  
using improved feedstock)

IT 7440-05-3, Palladium, uses 39286-82-3  
(H-permeable membrane; **fuel** processing system  
using improved feedstock)

IT 75-50-3, **Trimethylamine**, uses 102-69-2,  
Tripropylamine 109-73-9, n-Butylamine, uses 109-76-2,  
1,3-Diaminopropane 110-58-7, n-Pentylamine 110-60-1,  
1,4-Diaminobutane 111-26-2, n-Hexylamine 111-68-2, n-Heptylamine  
111-86-4, n-Octylamine 121-44-8, Triethylamine, uses 462-94-2,  
1,5-Diaminopentane 646-19-5, 1,7-Diaminoheptane 2016-57-1,  
n-Decylamine  
(**fuel** processing system using improved feedstock)

IT 1333-74-0P, **Hydrogen**, uses  
(**fuel** processing system using improved feedstock)

limits of **odorous** compounds in cattle feedlots. Miller, D. N.; Varel, V. H. (U.S. Meat Animal Research Center, ARS, USDA, Clay Center, NE, 68933-0166, USA). Journal of Animal Science (Savoy, IL, United States), 79(12), 2949-2956 (English) 2001. CODEN: JANSAG. ISSN: 0021-8812. Publisher: American Society of Animal Science.

AB Livestock **odors** are closely correlated to airborne concns. of volatile org. compds. (VOC), which are a complex mixt. of carbon-, sulfur-, and **nitrogen-contg. compds.** produced primarily during the incomplete anaerobic fermn. of animal manure by microorganisms. Volatile fatty acids, alcs., and arom. ring compds. comprise a substantial fraction of VOC, yet very little is known about their biochem. origin and environmental factors controlling their prodn. The anaerobic prodn. of fermn. products and consumption of substrates (CP, starch, and nonstarch carbohydrate) were analyzed in slurries of fresh (< 24 h) and aged (> 1 day) cattle manure over several weeks. Ethanol, acetate, propionate, butyrate, lactate, and **H2** were the major products of fermn. Aged cattle manure produced twice the concn. of VFA during incubation produced by the fresh manure ( $P < 0.001$ ). Arom. compds. (phenols, indoles, and benzoates) remained unchanged in both manures. Prod. of VFA from fresh manure was inhibited when the pH fell below 4.5. It is likely that the presence of calcareous soil, which has a high buffering capacity, and lactate-consuming microorganisms minimized acidification in the aged manure slurries. Low starch content limited VFA prodn. in the aged manure. Starch was the likely biochem. source for fermn. products in both manures based on the strong neg. correlations between fermn. product and starch content ( $r = -0.944$  and  $-0.773$ ) and ratio of fermn. products produced to starch consumed ( $r = 0.64$  and  $0.72$ ) for fresh and aged manure, resp. Nonstarch carbohydrate served an indeterminate role in the prodn. of fermn. products. Nonstarch carbohydrate decreased by 4.7 and 23.4 g/L in the fresh and aged manure, resp., whereas the starch content decreased by 18.6 and 22.4 g/L in the fresh and aged manure, resp. The concn. of CP did not change, which suggests a balance between protein consumption and new bacterial biomass prodn. We conclude that the types of substrates in cattle manure and the feedlot soils where they are deposited are significant factors in the prodn. of **odors**.

IT 1333-74-0, Hydrogen, biological studies  
(compn. and origin of cattle feedlot **odors**)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

CC 13-7 (Mammalian Biochemistry)

- ST manure cattle feedlot **odor**  
IT Manure  
    **Odor and Odorous substances**  
        (compn. and origin of cattle feedlot **odors**)  
IT Carbohydrates, biological studies  
    (compn. and origin of cattle feedlot **odors**)  
IT Phenols, biological studies  
    Volatile organic compounds  
        (compn. and origin of cattle feedlot **odors**)  
IT Soils  
    (feedlot; compn. and origin of cattle feedlot **odors**)  
IT 9005-25-8, Starch, biological studies  
    (compn. and origin of cattle feedlot **odors**)  
IT 50-21-5, biological studies 64-17-5, Ethanol, biological studies  
    64-19-7, Acetic acid, biological studies 65-85-0D, Benzoic acid,  
    derivs. 79-09-4, Propanoic acid, biological studies 107-92-6,  
    Butanoic acid, biological studies 120-72-9D, Indole, derivs.  
    **1333-74-0**, Hydrogen, biological studies  
        (compn. and origin of cattle feedlot **odors**)
- L52 ANSWER 5 OF 24 HCA COPYRIGHT 2004 ACS on STN  
136:186510 Fuels and fuel processors for the **fuel cell**  
    industry. Cole, Jerald A. (Res. Development Dep., HbT, Inc., Long  
    Beach, CA, 90815, USA). Preprints of Symposia - American Chemical  
    Society, Division of Fuel Chemistry, 46(2), 646-647 (English) 2001.  
    CODEN: PSADFZ. ISSN: 1521-4648. Publisher: American Chemical  
    Society, Division of Fuel Chemistry.
- AB An overview is given on the anticipated problems assocd. with  
    variability in fuel properties for steam reformers and other fuel  
    processing units that are to produce hydrogen for consumption by  
    commercialized and widely distributed **fuel cells**  
    (e.g., for automotive uses). For example, natural gas properties  
    can change from one location to another, and even with the time of  
    day or time of year in a single location. Similarly, propane or LPG  
    have specifications that vary geog. and geopolitically. Although  
    some of these concerns can be addressed through robust design of the  
    fuel processor control system, designers of fuel processing  
    equipment are challenged to come up with better process designs at  
    the same time that catalyst manufacturers are being asked to provide  
    more durable catalysts with greater feedstock flexibility while  
    maintaining low cost.
- IT **7704-34-9D**, Sulfur, org. compds.  
    (impurities; problems assocd. with property variations of  
    feedstocks for steam reforming in manuf. of **hydrogen**  
    for **fuel cells**)
- RN 7704-34-9 HCA  
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

IT 1333-74-0P, Hydrogen, preparation  
(manuf. of; problems assocd. with property variations of  
feedstocks for steam reforming in manuf. of **hydrogen**  
for **fuel cells**)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 51

ST steam reforming **hydrogen** manuf **fuel cell**  
; natural **gas** property variation **hydrogen** manuf;  
LPG property variation hydrogen manuf

IT Alkenes, miscellaneous  
(C2-5, impurities; problems assocd. with property variations of  
feedstocks for steam reforming in manuf. of **hydrogen**  
for **fuel cells**)

IT Petroleum products  
(gases, liquefied, steam reforming of; problems assocd. with  
property variations of feedstocks for steam reforming in manuf.  
of **hydrogen** for **fuel cells**)

IT **Fuel cells**  
(**hydrogen** for; problems assocd. with property  
variations of feedstocks for steam reforming in manuf. of  
**hydrogen** for **fuel cells**)

IT Steam reforming  
(of hydrocarbon feedstocks; problems assocd. with property  
variations of feedstocks for steam reforming in manuf. of  
**hydrogen** for **fuel cells**)

IT Steam reforming catalysts  
(problems assocd. with property variations of feedstocks for  
steam reforming in manuf. of **hydrogen** for **fuel**  
**cells**)

IT Natural gas, reactions  
(steam reforming of; problems assocd. with property variations of  
feedstocks for steam reforming in manuf. of **hydrogen**  
for **fuel cells**)

IT **Fuel gas** manufacturing  
(steam reforming, of hydrocarbon feedstocks; problems assocd.  
with property variations of feedstocks for steam reforming in  
manuf. of **hydrogen** for **fuel cells**)

IT **Odor** and **Odorous** substances  
(sulfur-contg., impurities; problems assocd. with property

- variations of feedstocks for steam reforming in manuf. of **hydrogen for fuel cells**)
- IT 7704-34-9D, Sulfur, org. compds.  
(impurities; problems assocd. with property variations of feedstocks for steam reforming in manuf. of **hydrogen for fuel cells**)
- IT 1333-74-0P, Hydrogen, preparation  
(manuf. of; problems assocd. with property variations of feedstocks for steam reforming in manuf. of **hydrogen for fuel cells**)
- IT 74-98-6, Propane, reactions  
(steam reforming of; problems assocd. with property variations of feedstocks for steam reforming in manuf. of **hydrogen for fuel cells**)
- L52 ANSWER 6 OF 24 HCA COPYRIGHT 2004 ACS on STN  
133:47867 Analysis using a Jerome 631-X portable hydrogen sulfide sensor: laboratory and field evaluation. Winegar, Eric D.; Schmidt, C. E. (Applied Measurement Science, Fair Oaks, CA, 95628, USA). Measurement of Toxic and Related Air Pollutants, Proceedings of a Specialty Conference, Cary, NC, United States, Sept. 1-3, 1998, Volume 1, 423-433. Air & Waste Management Association: Pittsburgh, Pa. (English) 1998. CODEN: 69AAKD.
- AB An accurate, precise field sensor to detect and quantify H<sub>2</sub>S is needed for a variety of environmental and industrial applications, including **odor** assessments, health and **safety** investigations, routine industrial/off-site neighborhood monitoring programs, and regulatory compliance issues. A study was conducted to obtain rigorous performance data for the use of the Jerome 631-X instrument for regulatory, industrial and environmental assessments, and health and **safety** uses. Data are presented on: operational or functionality tests designed to define sample anal. capability; lab. performance including precision/accuracy testing, interferent response factor detn. for reduced S compds., and and detection limits studies; and field performance vs. ref. method results.
- CC 59-1 (Air Pollution and Industrial Hygiene)  
Section cross-reference(s): 79, 80
- ST hydrogen sulfide detn air analysis; portable **gas** sensor  
**hydrogen** sulfide detn air
- IT Air analysis  
(lab. and field evaluation of portable gas sensor for detn. of hydrogen sulfide alone and in gas mixts. **contg.** reduced **sulfur compds.**)
- IT Gas sensors  
(portable; lab. and field evaluation of portable gas sensor for detn. of hydrogen sulfide alone and in gas mixts. **contg** . reduced **sulfur compds.**)



- IT 7783-06-4, Hydrogen sulfide, analysis  
(lab. and field evaluation of portable gas sensor for detn. of hydrogen sulfide alone and in gas mixts. **contg.** reduced **sulfur compds.**)
- L52 ANSWER 7 OF 24 HCA COPYRIGHT 2004 ACS on STN  
132:198147 Applications of semiconductor **odor** sensor to air cleaners. Kawaguchi, Tomohiro; Mizuno, Eriko; Yokoo, Eijyu; Setoguchi, Yasuhiro; Nakahara, Takeshi; Yasunaga, Susumu (Figaro Engineering Inc., Senbanishi, Minoo-shi, Osaka, 562-8505, Japan). Chemical Sensors, 15(Suppl. B, Proceedings of the 29th Chemical Sensor Symposium, 1999), 106-108 (Japanese) 1999. CODEN: KAGSEU. Publisher: Denki Kagakkai Kagaku Sensa Kenkyukai.
- AB In order to operate air cleaners automatically, the demand for gas sensors that can detect various **odors** at high sensitivity has increased. We investigated two types of new gas sensors. "Sensor A (TGS2602)" exhibited high sensitivity to several volatile org. compd. gases, and was effective to detect building material **odors**, such as varnish, wood adhesive and wood preservatives. On the other hand, "Sensor B (under development)" exhibited high sensitivity to sulfur and nitrogen compd. gases, and was effective to detect offensive **odors**, such as kitchen garbage, toilet **smells**, etc. Furthermore, as these sensors exhibit low sensitivity to **odorless** gases, such as **H2**, they can monitor the effect of deodorization as compared to usual sensors (TGS2600) when an air cleaner is operated.
- IT 7727-37-9D, Nitrogen, compds., analysis  
(applications of semiconductor **odor** sensor to air cleaners)
- RN 7727-37-9 HCA  
CN Nitrogen (8CI, 9CI) (CA INDEX NAME)
- N≡N
- CC 59-1 (Air Pollution and Industrial Hygiene)  
ST semiconductor **odor** sensor application air cleaner  
IT Wood  
(adhesives, **odors**; applications of semiconductor **odor** sensor to air cleaners)
- IT Air analysis  
Air purification apparatus  
Gas sensors  
**Odor** and **Odorous** substances  
Semiconductor gas sensors  
(applications of semiconductor **odor** sensor to air cleaners)
- IT Volatile organic compounds

- (gaseous; applications of semiconductor **odor** sensor to air cleaners)
- IT Municipal refuse  
(kitchen, **odors**; applications of semiconductor **odor** sensor to air cleaners)
- IT Construction materials  
Toilets  
Varnishes  
Wood preservatives  
(**odors**; applications of semiconductor **odor** sensor to air cleaners)
- IT Adhesives  
(wood, **odors**; applications of semiconductor **odor** sensor to air cleaners)
- IT 7704-34-9D, Sulfur, compds., analysis 7727-37-9D, Nitrogen, compds., analysis  
(applications of semiconductor **odor** sensor to air cleaners)
- L52 ANSWER 8 OF 24 HCA COPYRIGHT 2004 ACS on STN
- 132:165302 Low molecular weight products formation in the interaction of L-ascorbic acid (vitamin C) with amino acids. Rogacheva, S.; Kuncheva, M.; Verhe, R.; Obretenov, Tsv. (Organic Chem. Dept., Higher Inst. Food Flavor Industry, Plovdiv, 4002, Bulg.). Nauchni Trudove - Vissh Institut po Khranitelna i Vkusova Promishlenost, Plovdiv, 43, 355-360 (Bulgarian) 1998. CODEN: NTKVAH. ISSN: 0477-0250. Publisher: Vissh Institut po Khranitelna i Vkusova Promishlenost.
- AB Maillard reaction of L-ascorbic acid with **N-contg** . **compds.** produces reactive mols. involved in the nonenzymic food browning. Furan, pyrazine, and imidazole derivs. are the best known products and are possible precursors of melanoidins. Some melanoidins are of vital significance for the taste and **aroma** of fruit juices and concs. The nature of volatile intermediates arising from L-ascorbic acid interactions with glycine, L-lysine, and L-glutamic acid was studied using exposure to 100°C for 1, 7, 50, and 100 h under inert **atm.** Ascorbic acid was a precursor in the prodn. of **aroma** compds. generated. The type of amino acid played an important role in the Maillard reaction color and flavor development. The acidic L-glutamic acid caused mainly L-ascorbic acid decompn. Under basic conditions the condensation reactions of L-ascorbic acid with L-lysine dominated and a large no. of **N -contg.** heterocyclic **compds.** were produced. The volatile compds. were analyzed by GC-MS and up to 244 reaction products were isolated. The compds. belonged to the groups of aliph. and arom. hydrocarbons, aliph. and carbocyclic O-contg. compds., furan derivs., N-heterocycles, phenols, pyrans, and others.

The highest amts. were reached by 2-acetylfuran, cyclohexanone, 2-furancarboxylic acid, 2,6-bis(1,1-dimethylethyl)-4-methylphenol, 4-diethylaminobenzaldehyde, 2-furfural, toluene, and methylpyrazine.  
CC 17-4 (Food and Feed Chemistry)

L52 ANSWER 9 OF 24 HCA COPYRIGHT 2004 ACS on STN

132:11833 Full-nutrient health-care food and its production method.  
Wang, Lijun (Peop. Rep. China). Faming Zhuanli Shenqing Gongkai  
Shuomingshu CN 1171208 A 19980128, 10 pp. (Chinese). CODEN:  
CNXXEV. APPLICATION: CN 1996-118800 19961120.

AB The food is composed of animal and plant product (including algae, earthworm of Guandong, fresh cattle bone, hyacinth bean, fresh pig blood), food additive (Cu-Na chlorophyll, Ca lactate, Zn lactate, Fe lactate, Mn acetate), special supplementary (Se rich yeast, Cr rich yeast, fish liver oil conc.,  $\alpha$ -tocopherol, L-ascorbic acid, thiamin, riboflavin phosphate, folic acid, Vb12, and edible flavor). The food prepg. method comprises animal and plant raw material mixing and pulverizing, mineral spring water immersing, boiling at 2 atm for 2 h, setting for 3 h, filtrating to get supernatant, adding additives and supplementaries, vacuum drying at 50°, pulverizing, adding edible flavor, packing, sterilizing to get final product.

IT 7782-49-2, Selenium, biological studies.  
(yeast rich in; full-nutrient health-care food and prodn. method)  
RN 7782-49-2 HCA  
CN Selenium (8CI, 9CI) (CA INDEX NAME)

Se

IC ICM A23L001-29  
ICS A23L001-30

CC 17-14 (Food and Feed Chemistry)  
Section cross-reference(s): 18

IT Algae  
Dolichos lablab  
Earthworm  
Health food

**Odor and Odorous** substances

(full-nutrient health-care food and prodn. method)

IT 7440-47-3, Chromium, biological studies 7782-49-2,  
Selenium, biological studies  
(yeast rich in; full-nutrient health-care food and prodn. method)

L52 ANSWER 10 OF 24 HCA COPYRIGHT 2004 ACS on STN

124:210776 Sludge management using the biodegradable organic fraction of municipal solid waste as a primary substrate. Kayhanian, Masoud; Rich, Dan (Dep. Civil Environmental Engineering, Univ. California,

Davis, CA, 95616, USA). Water Environment Research, 68(2), 240-52 (English) 1996. CODEN: WAERED. ISSN: 1061-4303. Publisher: Water Environment Federation.

AB An innovative anaerobic composting process was used to manage wastewater treatment plant sludges using the biodegradable org. fraction (BOF) in municipal solid waste (MSW) as a primary substrate. Three types of wastewater treatment plant sludges (primary, thickened activated, digested) were commingled with a simulated biodegradable org. fraction of municipal solid waste and used as a feedstock. Digester performance was evaluated for each feedstock under similar retention times, a const. total solids content, and a const. C:N ratio. Addnl. aspects of the process included vol. redn., air emission, and humus characteristics. Results indicated that stable, robust digestion was achieved using org. loading rates of 6.5-8 g biodegradable volatile solids/kg active reactor mass-day. Under these org. loading rates, CH<sub>4</sub> gas prodn. rates as high as 0.36 m<sup>3</sup>/kg biodegradable volatile solids added/day were obtained, gasifying approx. half the feedstock dry mass. Substrate vol. redn. through the process was .apprx.65-69% compared with the same quantities of sludge and MSW in a well-compacted landfill. Emissions produced from anaerobic digestion and aerobic bio-drying had no adverse effect on human health or the environment. Humus produced is a fine, **odorless**, pathogen-free material with metal pollutant concns. well below clean sludge stds. specified by EPA in Part 503 of the Code of Federal Regulations.

IT 1333-74-0, **Hydrogen**, biological studies  
(gas constituents of two-stage anaerobic composting  
co-digestion of wastewater sludge and biodegradable org. fraction  
of municipal solid waste)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

IT 7782-49-2, **Selenium**, occurrence  
(humus characteristics of two-stage anaerobic composting  
co-digestion of wastewater sludge and biodegradable org. fraction  
of municipal solid waste)

RN 7782-49-2 HCA

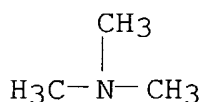
CN Selenium (8CI, 9CI) (CA INDEX NAME)

Se

CC 60-4 (Waste Treatment and Disposal)  
Section cross-reference(s): 10, 59

- IT 74-82-8, Methane, biological studies 74-84-0, Ethane, biological studies 74-85-1, Ethene, biological studies 74-86-2, Acetylene, biological studies 124-38-9, Carbon dioxide, biological studies 630-08-0, Carbon monoxide, biological studies **1333-74-0, Hydrogen**, biological studies 7446-09-5, Sulfur dioxide, biological studies 7783-06-4, Hydrogen sulfide, biological studies 10102-44-0, Nitrogen dioxide, biological studies  
(gas constituents of two-stage anaerobic composting co-digestion of wastewater sludge and biodegradable org. fraction of municipal solid waste)
- IT 7439-92-1, Lead, occurrence 7439-97-6, Mercury, occurrence 7439-98-7, Molybdenum, occurrence 7440-02-0, Nickel, occurrence 7440-09-7, Potassium, occurrence 7440-38-2, Arsenic, occurrence 7440-43-9, Cadmium, occurrence 7440-47-3, Chromium, occurrence 7440-50-8, Copper, occurrence 7440-66-6, Zinc, occurrence 7723-14-0, Phosphorus, occurrence 7727-37-9, Nitrogen, occurrence **7782-49-2, Selenium**, occurrence  
(humus characteristics of two-stage anaerobic composting co-digestion of wastewater sludge and biodegradable org. fraction of municipal solid waste)
- L52 ANSWER 11 OF 24 HCA COPYRIGHT 2004 ACS on STN  
122:321211 Evaporation of offensive odors from wastewater into the atmosphere. Determination of air water Henry's law constants. Nishida, Konosuke; Osako, Masahiro; Higuchi, Takashi; Higuchi, Takaya; Kitagawa, Masayuki; Endo, Jun (Fac. Eng., Kyoto Univ., Kyoto, 606, Japan). Mizu Shori Gijutsu, 36(2), 57-75 (Japanese) 1995. CODEN: MSYGAO. ISSN: 0026-7015. Publisher: Nippon Mizu Shori Gijutsu Kenkyukai.
- AB The air water Henry's law consts. for H<sub>2</sub>S, MeSH (MM), Me<sub>2</sub>S (DMS), NH<sub>3</sub> and **Me<sub>3</sub>N** (TMA) were detd. to study the evapn. of offensive odors from wastewater. In a closed column (4.8 cm in a diam.) contg. 1 L of a soln., N<sub>2</sub> gas was aerated in the soln. kept at a temp. of  $t \pm 0.5^\circ$  and the soln. was agitated with a stirrer. The gas flowing out from a outlet of the column was analyzed by using a GC method. The regression equations for the Henry's law consts. were:  $H$  (atm.L/mol) = exp (12.847.lnT K-71.91) for MM, exp (15.263.lnT-86.28) for DMS, exp (9.668.lnT-56.477) for TMA. The consts. obtained in the sea water at 20° were 11.34 for H<sub>2</sub>S, 3.15 for MM, 2.018 for DMS. The air water Henry's law consts. also were detd. by using a head-space method and the obtained consts. were equiv. to the air water Henry's law consts. detd. in intermediate phases which did not reach to the full equil. of gas and liq.
- IT **75-50-3, Trimethylamine**, occurrence  
(evapn. of offensive odors from wastewater into atm. and detn. of air water Henry's law consts.)
- RN 75-50-3 HCA

CN Methanamine, N,N-dimethyl- (9CI) (CA INDEX NAME)



- CC 59-4 (Air Pollution and Industrial Hygiene)  
Section cross-reference(s): 60
- ST air water **odorant** Henry const; odor substance evapn  
wastewater air
- IT 74-93-1, Methyl mercaptan, occurrence 75-18-3, Dimethyl sulfide  
**75-50-3, Trimethylamine**, occurrence 7664-41-7,  
Ammonia, occurrence 7783-06-4, Hydrogen sulfide, occurrence  
(evapn. of offensive odors from wastewater into atm. and detn. of  
air water Henry's law consts.)
- L52 ANSWER 12 OF 24 HCA COPYRIGHT 2004 ACS on STN  
120:252192 Characteristics of humus produced from the anaerobic  
composting of the biodegradable organic fraction of municipal solid  
waste. Kayhanian, Masoud; Tchobanoglous, George (Dep. Civ. Environ.  
Eng., Univ. California, Davis, CA, 95616, USA). Environmental  
Technology, 14(9), 815-29 (English) 1993. CODEN: ENVTEV. ISSN:  
0959-3330.
- AB Phys., chem., and biol. characteristics of humus produced from the  
biodegradable org. fraction of municipal solid waste, using an  
anaerobic composting process, were evaluated. Based on results  
obtained to date, the anaerobic composting process represents an  
effective alternative technol. to aerobic composting, with the added  
advantage of recovery of energy in the form of CH<sub>4</sub>.
- IT **1333-74-0**, Hydrogen, miscellaneous **7782-49-2**,  
Selenium, miscellaneous  
(in humus from anaerobic biodegrdn. of org. fraction of municipal  
solid waste)
- RN 1333-74-0 HCA
- CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

- RN 7782-49-2 HCA
- CN Selenium (8CI, 9CI) (CA INDEX NAME)

Se

- CC 60-1 (Waste Treatment and Disposal)  
Section cross-reference(s): 4, 10

- IT Biodegradable materials  
Color  
Electric conductivity and conduction  
Odor and Odorous substances  
(of humus from anaerobic biodegrdn. of org. fraction of municipal solid waste)
- IT 1333-74-0, Hydrogen, miscellaneous 7429-90-5, Aluminum, miscellaneous 7439-89-6, Iron, miscellaneous 7439-92-1, Lead, miscellaneous 7439-95-4, Magnesium, miscellaneous 7439-96-5, Manganese, miscellaneous 7439-98-7, Molybdenum, miscellaneous 7440-02-0, Nickel, miscellaneous 7440-09-7, Potassium, miscellaneous 7440-23-5, Sodium, miscellaneous 7440-33-7, Tungsten, miscellaneous 7440-37-1, Argon, miscellaneous 7440-38-2, Arsenic, miscellaneous 7440-42-8, Boron, miscellaneous 7440-43-9, Cadmium, miscellaneous 7440-47-3, Chromium, miscellaneous 7440-48-4, Cobalt, miscellaneous 7440-50-8, Copper, miscellaneous 7440-66-6, Zinc, miscellaneous 7440-70-2, Calcium, miscellaneous 7631-86-9, Silica, miscellaneous 7704-34-9, Sulfur, miscellaneous 7723-14-0, Phosphorus, miscellaneous 7782-44-7, Oxygen, miscellaneous 7782-49-2, Selenium, miscellaneous 7782-50-5, Chlorine, miscellaneous 9004-34-6, Cellulose, miscellaneous 9005-53-2, Lignin, miscellaneous 9034-32-6, Hemicellulose 12408-02-5, Hydrogen ion, miscellaneous  
(in humus from anaerobic biodegrdn. of org. fraction of municipal solid waste)

L52 ANSWER 13 OF 24 HCA COPYRIGHT 2004 ACS on STN

116:135528 Performance-oriented packaging standards; changes to classification, hazard communication, packaging and handling requirements based on UN standards and agency initiative. (United States Dept. of Transportation, Washington, DC, 20590-0001, USA). Federal Register, 55(246), 52402-729 (English) 21 Dec 1990. CODEN: FEREAC. ISSN: 0097-6326.

L52 ANSWER 14 OF 24 HCA COPYRIGHT 2004 ACS on STN

111:221990 Apparatus for evaporative concentration of photographic processing waste solutions. Kurematsu, Masayuki; Koboshi, Shigeharu; Goshima, Nobutaka; Takabayashi, Naoki (Konica Co., Japan). Jpn. Kokai Tokkyo Koho JP 01038188 A2 19890208 Heisei, 22 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1987-194616 19870804.

AB In an app. for effecting the evaporative concn. of photog. processing waste solns., the steam and(or) its condensates are contacted with  $\geq 1$  material selected from Ge, Se, Te, GaP, Bi<sub>2</sub>Te<sub>3</sub>, InP, CoO, FeO, Fe<sub>2</sub>O<sub>3</sub>, WO<sub>3</sub>, VO<sub>2</sub>, MoS<sub>2</sub>, Si, Ta<sub>2</sub>N, Ta-SiO<sub>2</sub>, ZrN, TiN, Cr-Si-O, SiC, SiC-Zr, SiC-Cr, SiC-Hf, SiC-Ti, SiC-Mo, SiC-W, SiC-Nb, SiC-Ta, SiC-La, B, B-Mo, B-La, B-Cr, B-Ti, B-Na,

B-Ta, B-W, B-V, C, C-halogen, C-Si, C-Ge, C-H, Pt, Mo, and Mo-Si. Optionally, the materials above are used together with  $\geq 1$  material selected from activated C, clays, polyamides, polyurethanes, phenolic resins, epoxy resins, OH-contg. polymers, PTFE-contg. polymers, and polyesters. The condensates are clear and colorless and of a low-odor level to permit their discharge into public sewer systems.

IT 1333-74-0, Hydrogen, uses and miscellaneous  
 7782-49-2, Selenium, uses and miscellaneous  
 (adsorbent, for treatment of photog. waste soln. distillate)  
 RN 1333-74-0 HCA  
 CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

RN 7782-49-2 HCA  
 CN Selenium (8CI, 9CI) (CA INDEX NAME)

Se

IC ICM C02F001-04  
 ICS B01D053-34; C02F001-28; G03C005-00; G03D013-00  
 CC 74-2 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 Section cross-reference(s): 60  
 IT 409-21-2, Silicon carbide, uses and miscellaneous 1304-82-1, Bismuth telluride ( $\text{Bi}_2\text{Te}_3$ ) 1307-96-6, Cobalt oxide ( $\text{CoO}$ ), uses and miscellaneous 1309-37-1, Ferric oxide, uses and miscellaneous 1314-35-8, Tungsten oxide, uses and miscellaneous 1317-33-5, Molybdenum disulfide, uses and miscellaneous 1333-74-0, Hydrogen, uses and miscellaneous 1345-25-1, Iron oxide ( $\text{FeO}$ ), uses and miscellaneous 7439-91-0, Lanthanum, uses and miscellaneous 7439-98-7, Molybdenum, uses and miscellaneous 7440-03-1, Niobium, uses and miscellaneous 7440-06-4, Platinum, uses and miscellaneous 7440-21-3, Silicon, uses and miscellaneous 7440-23-5, Sodium, uses and miscellaneous 7440-25-7, Tantalum, uses and miscellaneous 7440-32-6, Titanium, uses and miscellaneous 7440-33-7, Tungsten, uses and miscellaneous 7440-42-8, Boron, uses and miscellaneous 7440-44-0, Carbon, uses and miscellaneous 7440-56-4, Germanium, uses and miscellaneous 7440-58-6, Hafnium, uses and miscellaneous 7440-62-2, Vanadium, uses and miscellaneous 7440-67-7, Zirconium, uses and miscellaneous 7782-44-7, Oxygen, uses and miscellaneous 7782-49-2, Selenium, uses and miscellaneous 11126-22-0, Silicon oxide 12033-63-5, Tantalum nitride ( $\text{Ta}_2\text{N}$ ) 12036-21-4, Vanadium dioxide 12063-98-8, Gallium phosphide, uses and miscellaneous 12672-48-9, Chromium silicon oxide 13494-80-9,



Tellurium, uses and miscellaneous 22398-80-7, Indium phosphide, uses and miscellaneous 25583-20-4, Titanium nitride (TiN) 25658-42-8, Zirconium nitride (ZrN) (adsorbent, for treatment of photog. waste soln. distillate)

L52 ANSWER 15 OF 24 HCA COPYRIGHT 2004 ACS on STN

106:121825 Improving the quality of catalytically prepared polyalkylene polyamines. Doumaux, Arthur Roy, Jr. (Union Carbide Corp., USA). Eur. Pat. Appl. EP 200250 A2 19861210, 23 pp. DESIGNATED STATES: R: BE, DE, FR, GB, IT, NL, SE. (English). CODEN: EPXXDW. APPLICATION: EP 1986-200578 19860404. PRIORITY: US 1985-720155 19850404.

AB Polyalkylene polyamines with improved quality are prep'd. by supplying H during reaction of a reactive **N-contg** . **compd.** like NH<sub>3</sub>, a primary or secondary amine, or a polyamine (with  $\geq 2$  amino groups) with an alkanolamine in the presence of a catalyst contg. P, in a Lewis acid at an appropriate pressure and temp. The product has a Gardner Color of  $\leq 10$  and no burnt or scorched **odor**, as is found in the absence of H. Monoethanolamine (I) 45.8, ethylenediamine 90.3, and lanthanum acid phosphate 10.2 g were stirred (300°, 650 psig) with 5 mol% (on I) **H<sub>2</sub>**. The light yellow-brown-black-colored (color no. 9) polyethylene polyamines produced had only a very weak ammoniacal **odor**.

IT **1333-74-0**, Hydrogen, uses and miscellaneous  
(in quality improvement of polyalkylene polyamines)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

IC ICM C07C085-06

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)  
Section cross-reference(s): 35, 37

ST polyalkylene polyamine low **odor**; monoethanolamine  
ethylenediamine condensation; lanthanum acid phosphate catalyst

IT **1333-74-0**, Hydrogen, uses and miscellaneous  
(in quality improvement of polyalkylene polyamines)

L52 ANSWER 16 OF 24 HCA COPYRIGHT 2004 ACS on STN

94:35652 Deodorization of waste gases. (Nippon Chemical Industrial Co., Ltd., Japan; Kanba Kogyo K. K.). Jpn. Kokai Tokkyo Koho JP 55088828 19800704 Showa, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1978-161171 19781228.

AB **Odorants** (NH<sub>3</sub>, MeSH, H<sub>2</sub>S, Me<sub>2</sub>S, **Me<sub>3</sub>N**, phenols, and styrene) are removed from waste gases by sorption with MnO<sub>2</sub> suspensions. Thus, a waste gas contg. 16.8 ppm H<sub>2</sub>S was scrubbed

with 0.5N H<sub>2</sub>SO<sub>4</sub> soln. contg. 1 wt.% MnO<sub>2</sub> to give a gas contg. 0.8 ppm H<sub>2</sub>S.

IC B01D053-34

CC 59-2 (Air Pollution and Industrial Hygiene)

ST **odorant** removal waste gas; manganese dioxide deodorization waste gas; methyl sulfide removal waste gas; hydrogen sulfide removal waste gas; mercaptan removal waste gas; ammonia removal waste gas; **trimethylamine** removal waste gas; phenol removal waste gas; styrene removal waste gas

IT Waste **gases**

(**hydrogen** sulfide removal from, by scrubbing with acidic manganese dioxide-contg. suspension)

L52 ANSWER 17 OF 24 HCA COPYRIGHT 2004 ACS on STN

93:100860 Waste gas deodorization apparatus. Goto, Sotoharu; Takayama, Shunichi (Mitsubishi Heavy Industries, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 55039211 19800319 Showa, 3 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1978-110858 19780910.

AB **Odorants** (H<sub>2</sub>S, MeSH [74-93-1], Me<sub>2</sub>S [75-18-3], and Me<sub>2</sub>S<sub>2</sub> [624-92-0]) are removed from waste gas by countercurrent scrubbing with H<sub>2</sub>O<sub>2</sub> soln. in an app. contg. a bed of calcined CoO-activated C mixt. Thus, a waste gas (12,000 m<sup>3</sup>/h) was scrubbed with 0.2% H<sub>2</sub>O<sub>2</sub> soln. (1.8 m<sup>3</sup>/h) over the catalyst bed to give an effluent in which the pollutants were H<sub>2</sub>S 0.1, MeSH 0.07, Me<sub>2</sub>S 0.01, and Me<sub>2</sub>S<sub>2</sub> 0.01 ppm, vs. 4.25, 3.76, 0.46, and 0.25 ppm, resp., in the untreated waste gas.

IC B01D053-36

CC 59-2 (Air Pollution and Industrial Hygiene)

ST **odorant** removal waste gas app; cobalt oxide **odorant** oxidn catalyst; hydrogen sulfide removal waste gas; methyl sulfide removal waste gas; mercaptan removal waste gas; disulfide removal waste gas

IT Scrubbing

(for sulfur compd. removal from waste **gases**, **hydrogen** peroxide and calcined cobalt oxide and activated carbon mixts. in)

IT 1307-96-6, uses and miscellaneous

(mixt. with activated carbon, in sulfur compd. removal from waste **gases** by **hydrogen** peroxide scrubbing)

IT 7722-84-1, uses and miscellaneous

(scrubbing soln. contg., for **sulfur compd.** removal from waste gases in bed of calcined cobalt oxide-activated carbon mixts.)

L52 ANSWER 18 OF 24 HCA COPYRIGHT 2004 ACS on STN

93:78883 Treatment of waste gas **containing sulfur**

**compounds**. Furuya, Tomiaki; Okamoto, Masayoshi (Tokyo Shibaura Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP

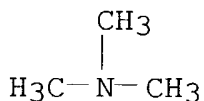
55041846 19800324 Showa, 4 pp. (Japanese). CODEN: JKXXAF.  
APPLICATION: JP 1978-114904 19780919.

- AB Waste gas **contg. S compds.** (e.g., H<sub>2</sub>S and mercaptans) is treated to remove the **odorants** by sorption with a sorbent contg. ≥1 org. or inorg. transition metal salts and the spent sorbent is regenerated by contacting with an O<sub>3</sub>-contg. gas. Thus, a waste gas (5 m<sup>3</sup>/min) contg. 40 ppm H<sub>2</sub>S was passed through an adsorber filled with 20% CuSO<sub>4</sub>-contg. activated C to give an effluent contg. undetectable amt. of H<sub>2</sub>S. After 10-h operation, the feed flow was switched to another similar adsorber while the old adsorber was treated with an O<sub>3</sub> contg. gas.
- IC B01D053-34; B01D053-04
- CC 59-2 (Air Pollution and Industrial Hygiene)
- ST waste gas deodorization app; hydrogen sulfide removal waste gas; mercaptan removal waste gas; copper sulfate sorption **odorant**; activated carbon sorption **odorant**
- IT Waste **gases**  
(**hydrogen** sulfide removal from, copper sulfate-impregnated activated carbon in, adsorbent regeneration by ozone in)

L52 ANSWER 19 OF 24 HCA COPYRIGHT 2004 ACS on STN

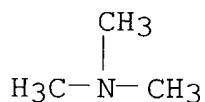
89:149104 Removal of **odorous** pollutants in synthesis gas production. Kubicka, Rudolf (J. Zelenka-Chem. Plant, Litvinov, Czech.). GWF, Gas/Erdgas, 119(5), 208-11 (German) 1978. CODEN: GWGEAQ. ISSN: 0016-4909.

- AB A malodorous pollutant, which formed in the manuf. of **H** and synthesis **gas** from **fuel** oil, was detd. to be NMe<sub>3</sub> [75-50-3]. This was produced by methylation of the NH<sub>3</sub> used in pH control by MeOH [67-56-1] formed in the conversion of the fuel oil. The formation of NMe<sub>3</sub> was avoided by the use of NaOH as alkalizing agent instead of NH<sub>3</sub>.
- IT 75-50-3P, preparation  
(formation of, in fuel oil gasification, prevention of)
- RN 75-50-3 HCA
- CN Methanamine, N,N-dimethyl- (9CI) (CA INDEX NAME)



- CC 51-9 (Fossil Fuels, Derivatives, and Related Products)  
Section cross-reference(s): 59
- ST fuel oil gasification pollution prevention; **trimethylamine** formation prevention gasification; air pollution prevention gasification; ammonia methylation methanol pollution
- IT Air pollution

- (by **trimethylamine**, in fuel oil gasification, prevention of)
- IT Fuel oil  
(gasification of, **trimethylamine** pollutant formation in, prevention of)
- IT Fuel gas manufacturing  
(gasification, of fuel oil, **trimethylamine** pollutant formation in, prevention of)
- IT Petroleum refining  
(gasification, **trimethylamine** pollutant formation in, prevention of)
- IT 75-50-3P, preparation  
(formation of, in fuel oil gasification, prevention of)
- L52 ANSWER 20 OF 24 HCA COPYRIGHT 2004 ACS on STN  
87:156330 Suppression of undesirable **odor** discharged in the production of **hydrogen** and synthesis-gas.  
Kubicka, Rudolf; Zalenka, Jan (Chem. Zavody, Cesk. Sovetskeho Pratelstvi, Litvinov, Czech.). Ochrana Ovzduši, 9(3), 41-4 (Czech) 1977. CODEN: OCOVAV. ISSN: 0322-8185.
- AB To prevent air pollution by foul **smelling Me3N** [75-50-3] in released CO2 from gas conversion, sources of the pollutant formation were investigated. Gas fed into the conversion was satd. with water vapor whose pH was adjusted to 7.5 by NH4 OH. Under conversion conditions, small amts. of MeOH were also formed. About 22% NH3 reacted with MeOH to give **Me3N**. After replacement of NH4OH by 15% NaOH, no **Me3N** formation was obsd.
- IT 75-50-3P, preparation  
(formation of, in prodn. of **hydrogen** and synthesis gas, prevention of)
- RN 75-50-3 HCA  
CN Methanamine, N,N-dimethyl- (9CI) (CA INDEX NAME)



- IT 1333-74-0P, preparation  
(manuf. of, suppression of **trimethylamine** odor in)
- RN 1333-74-0 HCA  
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

- CC 59-2 (Air Pollution and Industrial Hygiene)  
Section cross-reference(s): 51
- ST **trimethylamine** formation **fuel gas**  
prodn; hydrogen prodn **trimethylamine** formation;  
**odor** prevention **fuel gas** prodn
- IT Air pollution  
(by **trimethylamine**, in prodn. of **hydrogen** and  
synthesis **gas**, prevention of)
- IT **Fuel gas** manufacturing  
(**trimethylamine** formation in, prevention of)
- IT **Odor** and **Odorous** substances  
(**trimethylamine**, in production of **hydrogen**  
and synthesis **gas**)
- IT 75-50-3P, preparation  
(formation of, in prodn. of **hydrogen** and synthesis  
**gas**, prevention of)
- IT 1333-74-0P, preparation  
(manuf. of, suppression of **trimethylamine odor**  
in)

- L52 ANSWER 21 OF 24 HCA COPYRIGHT 2004 ACS on STN
- 82:116514 Bond and molecular polarizabilities of some polyatomic  
molecules. Sharma, D. K.; Pandey, A. N.; Pandey, B. N. (Dep. Phys.,  
Meerut Coll., Meerut, India). Acta Ciencia Indica, 1(1), 35-8  
(English) 1974. CODEN: ACIDBW. ISSN: 0379-5411.
- AB The  $\Delta$ -function potential model of chem. binding was used to  
calc. the bond and mol. polarizabilities of some polyat. mols.
- IT 593-69-1  
(bond and mol. polarizabilities of)
- RN 593-69-1 HCA
- CN Ethaneselenol (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

$\text{H}_3\text{C}-\text{CH}_2-\text{SeH}$

- IT 1333-74-0, properties  
(bonds of, with carbon, polarizability of)
- RN 1333-74-0 HCA
- CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

- CC 65-4 (General Physical Chemistry)
- IT 64-17-5, properties 75-18-3 75-50-3, properties 75-74-1  
79-38-9 107-12-0 359-08-0 359-29-5 432-04-2 593-69-1  
593-88-4 594-09-2 594-10-5 624-79-3 630-10-4 673-93-8  
758-24-7 819-01-2 10025-82-8 13450-88-9 13450-90-3

13450-91-4 13464-56-7 13465-09-3 13510-35-5 13769-36-3  
14518-97-9 14694-31-6 14779-74-9 14779-75-0 14986-65-3  
15230-48-5 18328-05-7 20328-44-3 21975-44-0 26638-19-7  
27072-47-5 39130-85-3 39695-58-4 54972-96-2

(bond and mol. polarizabilities of)

IT 1333-74-0, properties 7727-37-9, properties 7782-50-5,  
properties

(bonds of, with carbon, polarizability of)

L52 ANSWER 22 OF 24 HCA COPYRIGHT 2004 ACS on STN

67:86078 Magnetic rotation, magnetic susceptibility, and refraction  
moduli of the Se-H bond in selenols. Mila, Jean P.; Labarre, Jean  
F. (Dep. Chim. Inorg., Toulouse, Fr.). Comptes Rendus des Seances  
de l'Academie des Sciences, Serie C: Sciences Chimiques, 264(14),  
1157-9 (French) 1967. CODEN: CHDCAQ. ISSN: 0567-6541.

AB Five selenols of the type RSeH, with R varying from C<sub>2</sub>H<sub>5</sub> to C<sub>6</sub>H<sub>13</sub>,  
were prepd. by the method of Brandsma and Wijers (CA 59: 3762a).  
The magnetic rotation, magnetic susceptibility, and refraction of  
these compds. were measured at 20°. From these values, the  
moduli of the Se-H bonds are obtained. For the 3 measured  
properties, the moduli of the CH<sub>2</sub> groups are practically const. and  
close to their usual values.

IT 1333-74-0, properties

(bonds with selenium, magnetic susceptibility, magnetooptical  
rotation and optical refraction of, in selenols)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

IT 593-69-1

(magnetic susceptibility, magnetooptical rotation and optical  
refraction of hydrogen-selenium bond in)

RN 593-69-1 HCA

CN Ethaneselenol (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-CH<sub>2</sub>-SeH

CC 72 (Magnetic Phenomena)

IT 1333-74-0, properties

(bonds with selenium, magnetic susceptibility, magnetooptical  
rotation and optical refraction of, in selenols)

IT 593-69-1 624-69-1 16645-08-2 16645-09-3 17675-89-7

(magnetic susceptibility, magnetooptical rotation and optical  
refraction of hydrogen-selenium bond in)

L52 ANSWER 23 OF 24 HCA COPYRIGHT 2004 ACS on STN

53:6975 Original Reference No. 53:1301b-h Polycyclic compounds

containing nitrogen. II. Hydroindoles. Drake, Nathan L.; Ross, Alberta B. (Univ. of Maryland, College Park). Journal of Organic Chemistry, 23, 794-6 (Unavailable) 1958. CODEN: JOCEAH. ISSN: 0022-3263. OTHER SOURCES: CASREACT 53:6975.

AB cf. ibid. 717. Octahydro-5,6-dimethylindole (I) was prepd. by reduction of 4-(2-ethoxyethyl)-1,2-dimethyl-5-nitrocyclohexene (II) to 2-(2-ethoxyethyl)-4,5-dimethyl-cyclohexylamine (III) followed by cyclization. A product which probably contains 2,3,3a,4,7,7a- or 2,3,3a,6,7,7a-hexahydroindole (IV) was prepd. by a similar method from 4-(2-ethoxyethyl)-2-methoxy-5-nitrocyclohexene (V). Attempts to prep. the usual derivs. from the products of this latter cyclization were unsuccessful. III (4.83 g.) with 40 ml. 68% HBr heated 3 hrs. at 150° under N, cooled, and filtered gave 6.62 g. 2-(2-bromoethyl)-4,5-dimethylcyclohexylamine-HBr (VI), m. 196-7.5°; picrate, m. 139.5-40.0°. VI (4.82 g.) in 2 l. H<sub>2</sub>O added dropwise during 6.5 hrs. at 50° to 2 l. 0.1N NaOH, the soln. extd. with 500 ml. Et<sub>2</sub>O 2 days in a continuous extractor, 50 ml. C<sub>6</sub>H<sub>6</sub> added, and the solvents removed gave 1.50 g. I, amber oil, n<sub>25</sub>D 1.4804; picrate, m. 178-9° (50% alc.); 3,5-dinitrobenzoyl deriv., m. 175.6-6.6° (abs. alc.). EtOCH<sub>2</sub>CH:CHNO<sub>2</sub> (7 g.), 19.8 g. CH<sub>2</sub>:C(OMe)CH:CH<sub>2</sub>, a few mg. hydroquinone, and 20 ml. MeCN heated 6 hrs. at 100° in a steel bomb with a glass liner and distd. gave 5.7 g. V, b<sub>0.5</sub>-1.0 124-6°, n<sub>25</sub>D 1.4788, and 4.4 g. residue. The results were similar when the MeCN was omitted; a 56% yield was obtained. Redistn. gave 82% recovery of V as a yellow-green oil, b<sub>2</sub> 137-8°, n<sub>20</sub>D 1.4782, d<sub>20</sub> 1.102,  $\nu$  2844, 1658, 1377, 1178, 1166, 1117 cm.<sup>-1</sup> (2.5%, CCl<sub>4</sub>). V (8.9 g.) in 20 ml. 95% alc. left 3 hrs. in the refrigerator with 3 ml. concd. HCl and 4 ml. H<sub>2</sub>O, the mixt. dild. with 100 ml. H<sub>2</sub>O, neutralized, and extd. with Et<sub>2</sub>O gave 8.2 g. 3-(2-ethoxyethyl)-4-nitro-cyclohexanone (VII), n<sub>25</sub>D 1.4728. Distn. of crude VII at 116°/0.8 mm. gave 80% recovery; a 2nd distn. gave a yellow oil, n<sub>20</sub>D 1.4742, d<sub>20</sub> 1.128,  $\nu$  2844, 1722, 1373, 1350, and 1117 cm.<sup>-1</sup> (2.5%, CCl<sub>4</sub>); thiosemicarbazone, m., 113.5-14° (50% alc.). V (5.35 g.) in 50 ml. 95% alc. shaken 2 hrs. with 2 g. Pd-C with H at atm. pressure until 4 moles H was taken up, the soln. filtered, the solvent removed, and the product isolated gave 4.20 g. oil, n<sub>25</sub>D 1.4630, which was 2-(2-ethoxyethyl)-4-methoxycyclohexylamine (VIII); Bz deriv., m. 163-3.5° (50% alc.). VIII (3.65 g.) with 50 ml. 48% HBr caused warming to 40°; the mixt. heated 1.5 hrs. at 150° in N and 1.5 hrs. at 100° (crystn. did not occur) and evapd. under reduced pressure under N left a sticky residue of crude 4-bromo-2-(2-bromoethyl)cyclohexylamine-HBr which was not purified. I in 2 l. H<sub>2</sub>O added during 9 hrs. to 2.5 l. 0.2N NaOH at 50°, extd. continuously 2 days with Et<sub>2</sub>O, and evapd. gave

1.52 g. amber oil,  $n_{25D}$  1.5059, strong amine odor, did not react with NaI in Me<sub>2</sub>CO or with 2,4-(O<sub>2</sub>N)<sub>2</sub>C<sub>6</sub>H<sub>4</sub>NHNH<sub>2</sub>. The infrared spectrum of a 20% soln. in CCl<sub>4</sub> showed  $\nu$  3390, 3030, 2960, 1759, 1655, 1460, 1268, 1163, 1098, 1038, 677 cm.<sup>-1</sup> This product, IV, with BzCl or p-O<sub>2</sub>NC<sub>6</sub>H<sub>4</sub>COCl by the Schotten-Baumann method gave brown gums which could not be crystd. The derivs. decolorized Br in CCl<sub>4</sub>; the di-bromides were also noncryst. The chloroplatinate, m. 180-1° (decompn.) and could not be recrystd.

CC 10G (Organic Chemistry: Heterocyclic Compounds)

L52 ANSWER 24 OF 24 HCA COPYRIGHT 2004 ACS on STN

10:10986 Original Reference No. 10:2077h-i,2078a Reducing properties of hyposulfurous acid I. Action of sodium hyposulfite on selenium and tellurium. Chugaev, L. A.; Khlopin, V. G. Zhurnal Russkago Fiziko-Khimicheskago Obshchestva, 47, 364-72 (Unavailable) 1915. CODEN: ZRKOAC. ISSN: 0372-9877.

AB When Te is warmed to 70-80° with Na<sub>2</sub>S<sub>2</sub>O<sub>4</sub> and NaOH in an atm. of H<sub>2</sub>O a hydrate of sodium telluride Na<sub>2</sub>Te.nH<sub>2</sub>O (a) is obtained: colorless crystals, decomp. on exposure to the air with liberation of Te, gives with BzCl or BzPhMe<sub>2</sub>NCl benzyl telluride, (PhCH<sub>2</sub>)<sub>2</sub>Te: yellowish crystals of a slight garlic-like odor, m. 53-3.5°, difficultly volatile with steam, decomp. in the air with liberation of Te. The formation of (a) probably takes place in 2 stages (assuming the intermediate formation of Na<sub>2</sub>SO<sub>2</sub>, Binz, Ber. 38,2051): Na<sub>2</sub>SO<sub>2</sub> + Te = NaTeSO<sub>3</sub>.ONa; NaTeSO<sub>3</sub>.ONa + 2NaOH = Na<sub>2</sub>Te + Na<sub>2</sub>SO<sub>3</sub> + H<sub>2</sub>O (a) may also be prepd. by the action of rongalite on Te in presence of alkali: HOCH<sub>2</sub>O.S.ONa + Te + 3NaOH = Na<sub>2</sub>Te + CH<sub>2</sub>O + Na<sub>2</sub>SO<sub>3</sub> + 2H<sub>2</sub>O. Sodium selenide, Na<sub>2</sub>Se (b), was obtained from Se by the same method as (a), but with S the reaction was unsatisfactory. The formation of (a) or (b) readily takes place in small sealed tubes, and may be used as a lecture expt.

IT 7782-49-2, Selenium  
(reaction with sodium hyposulfite)

RN 7782-49-2 HCA

CN Selenium (8CI, 9CI) (CA INDEX NAME)

Se

CC 6 (Inorganic Chemistry)

IT 7782-49-2, Selenium 13494-80-9, Tellurium  
(reaction with sodium hyposulfite)

=> d 153 1-13 cbib abs hitstr hitind

L53 ANSWER 1 OF 13 HCA COPYRIGHT 2004 ACS on STN



- 139:280313 Hydrogen selenide. Documentation of proposed permissible values of occupational exposure levels. Kupczewska-Dobeczka, Malgorzata; Czerczak, Slawomir (Inst. Med. Pracy im. Jerzego Nofera, Lodz, 90-950, Pol.). Podstawy i Metody Oceny Srodowiska Pracy, 19(1), 135-144 (Polish) 2003. CODEN: PMOSC3. ISSN: 1231-868X. Publisher: Centralny Instytut Ochrony Pracy.
- AB Hydrogen selenide is a nonmetallic compd. currently receiving attention in both medicine and electronics. Hydrogen selenide is extremely flammable. Its toxicity results in multiple symptoms, the most characteristic of which is a garlicky **odor** of the breath. A single inhalation concn. LC50 of hydrogen selenide is reported to be between 1 and 12.7 mg/m3 for 1- and 8-h exposure. A young woman exposed repeatedly to **hydrogen** selenide **gas** developed gastrointestinal complaints, dental caries, conjunctivitis, nail deformities, and garlicky breath. Five cases of subacute intoxication from less than 0.67 mg/m3 of hydrogen selenide, probably generated from the use of selenious acid, have been reported. Gastrointestinal distress, dizziness, increased fatigue, moderate eye and nasal irritation, and a metallic taste in the mouth were reported. A LOAEL (lowest obsd. adverse effect level) of 0.67 mg/m3 was adopted. Given these data, the 8-h TWA value is 0.05 mg/3, and the STEL value is 0.1 mg/m3.
- IT 7783-07-5, Hydrogen selenide  
(documentation of proposed permissible values for occupational exposure to hydrogen selenide)
- RN 7783-07-5 HCA
- CN Hydrogen selenide (H2Se) (6CI, 8CI, 9CI) (CA INDEX NAME)
- H2Se
- CC 59-5 (Air Pollution and Industrial Hygiene)  
Section cross-reference(s): 4
- IT 7783-07-5, Hydrogen selenide  
(documentation of proposed permissible values for occupational exposure to hydrogen selenide)
- L53 ANSWER 2 OF 13 HCA COPYRIGHT 2004 ACS on STN
- 137:54843 Cleaning effect of ZnSe surface layer by hydrogen treatment. Sasaki, Yousuke; Imai, Kazuaki; Sawada, Takayuki; Kimura, Naohito; Tsubono, Isao; Saito, Hiroshi (Department of Electric and Electronic Engineering, Hokkaido Institute of Technology, Japan). Hokkaido Kogyo Daigaku Kenkyu Kiyo, 30, 249-254 (Japanese) 2002. CODEN: HODKDL. ISSN: 0385-0862. Publisher: Hokkaido Kogyo Daigaku.
- AB A quite simple and effective method has been proposed to remove the surface oxide layer of ZnSe substrate for homo-epitaxial growth. The **essence** of the method is irradiation of heated **H2** gas onto the sample surface. An MBE-ZnSe/GaAs, which is annealed in

O2 at 300° for 90 min, is used as the quasi-ZnSe substrate.  
The effectiveness is verified by RHEED, HRXRD and Q-mass analyzer.

IT 1315-09-9, Zinc selenide  
(surface-oxide cleaning effect of ZnSe surface layer by hydrogen treatment)  
RN 1315-09-9 HCA  
CN Zinc selenide (ZnSe) (9CI) (CA INDEX NAME)

Se=Zn

IT 1333-74-0, Hydrogen, uses  
(surface-oxide cleaning effect of ZnSe surface layer by hydrogen treatment)  
RN 1333-74-0 HCA  
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

CC 75-1 (Crystallography and Liquid Crystals)  
IT 1315-09-9, Zinc selenide  
(surface-oxide cleaning effect of ZnSe surface layer by hydrogen treatment)  
IT 1333-74-0, Hydrogen, uses  
(surface-oxide cleaning effect of ZnSe surface layer by hydrogen treatment)

L53 ANSWER 3 OF 13 HCA COPYRIGHT 2004 ACS on STN  
130:316437 Personal cleansing compositions comprising mid-chain branched surfactants. Vinson, Phillip Kyle; Coffindaffer, Timothy Woodrow; Cripe, Thomas Anthony; Stidham, Robert Emerson; Connor, Daniel Stedman (The Procter & Gamble Company, USA). PCT Int. Appl. WO 9918929 A1 19990422, 113 pp. DESIGNATED STATES: W: BR, CN, JP, MX, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1998-US21676 19981014. PRIORITY: US 1997-61975 19971014.

AB Personal cleansing products which include mid-chain branched surfactants are prep'd (Markush structures given). Sodium 7-methyltridecyl/n-tetradecyl ethoxylate sulfate (I) was prep'd. by the reaction of 7-methyltridecyl ethoxylate, n-tetradecanol ethoxylate and chlorosulfonic acid in the presence of sodium methoxide. A cleansing compn. contained NH4 C12-14 alkyl ethoxy sulfate 7.90, I 7.90, cocamide MEA 1.50, dimethicone DC-200 3.00, ethylene glycol distearate 1.50, citric acid 0.60, color, preservative, **fragrance**, and water q.s. 100%.

IT 7488-56-4, Selenium sulfide  
(personal cleansing compns. comprising mid-chain branched

surfactants)

RN 7488-56-4 HCA

CN Selenium sulfide (SeS2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



IT 1333-74-0, Hydrogen, reactions

(personal cleansing compns. comprising mid-chain branched  
surfactants)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

IC ICM A61K007-50

CC 62-4 (Essential Oils and Cosmetics)

Section cross-reference(s): 23, 46

IT 7488-56-4, Selenium sulfide 13463-41-7, Zinc pyrithione

25086-89-9, Vinyl pyrrolidone vinyl acetate copolymer 42557-10-8

62066-08-4 65497-29-2, Jaguar C-17 81859-24-7 98616-25-2

125321-30-4, 2-Ethylhexyl acrylate tert-butyl acrylate copolymer

128248-88-4, 2-Ethylhexyl methacrylate-tert-butyl acrylate copolymer

206126-27-4, tert-Butyl acrylate-dimethylsilane diol-2-Ethylhexyl  
methacrylate graft copolymer

(personal cleansing compns. comprising mid-chain branched  
surfactants)

IT 75-21-8, Oxirane, reactions 111-13-7, 2-Octanone 603-35-0,

Triphenylphosphine, reactions 630-08-0, Carbon monoxide, reactions

1333-74-0, Hydrogen, reactions 4286-55-9,

6-Bromo-1-hexanol 7790-94-5, Chlorosulfonic acid 27306-79-2

95144-24-4, Luviquat FC 370

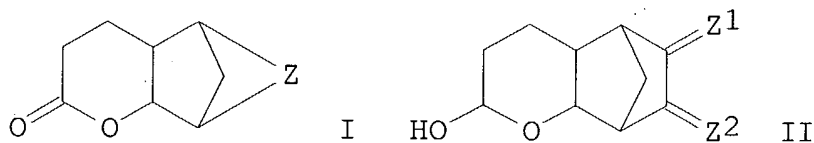
(personal cleansing compns. comprising mid-chain branched  
surfactants)

L53 ANSWER 4 OF 13 HCA COPYRIGHT 2004 ACS on STN

98:143278 **Oxygen-containing** polycyclic

**compounds.** Skorianetz, Werner; Ohloff, Guenther (Firmenich  
S. A., Switz.). Patentschrift (Switz.) CH 633008 A 19821115, 4  
pp. (French). CODEN: SWXXAS. APPLICATION: CH 1978-9449 19780908.  
PRIORITY: LU 1977-78181 19770926.

GI



- AB Fused pyranones I [ $Z = \text{CHEtCH}_2$ ,  $\text{C}(:\text{CHMe})\text{CH}_2$ ], useful in **perfumes** (no examples), were prepd. Thus, ethylidenenorbornene underwent a Diels-Alder reaction with acrolein, the adduct obtained was chem. hydrated to alcs. II (one of Z1 and Z2 is H2 and the other is CHMe), and the latter were oxidized ( $\text{CrO}_3$  or  $\text{MnO}_2$ ) to give I [ $Z = \text{C}(:\text{CHMe})\text{CH}_2$ ].
- IC C07D311-94; A61K007-46; C11B009-00
- CC 27-14 (Heterocyclic Compounds (One Hetero Atom))  
Section cross-reference(s): 62
- ST pyranonorbornanone perhydro prepn **perfume; perfume**  
perhydropyranonorbornanone
- IT **Perfumes and Essences**  
(perhydropyranonorbornanones)

L53 ANSWER 5 OF 13 HCA COPYRIGHT 2004 ACS on STN

50:93389 Original Reference No. 50:17484h-i,17485a-d The **odorous** products of peanut oil. II. Lefort, Daniel; Sorba, Janine (Lab. Général Corps C.N.R.S., Bellevue). Bulletin de la Societe Chimique de France 69-75 (Unavailable) 1956. CODEN: BSCFAS. ISSN: 0037-8968.

AB cf. C.A. 48, 388d. Three l. of a MeOH ext. (I) of the **odorous** fraction of peanut oil were distd. and the first 200 ml. of distillate collected in an aq. soln. of 2,4-dinitrophenylhydrazine. Evapn. of MeOH and removal of excess reagent gave 60 mg. of a crude product identified as hexanal (2,4-dinitrophenylhydrazone m. 101.5-102.5°). A noncarbonyl fraction (II) was obtained from I by washing with  $\text{Na}_2\text{CO}_3$  and treating with  $\text{NaHSO}_3$  to obtain the previously identified 2,4-decadienal. Absorption of 10.2 g. of II on alumina and elution with hexane gave 0.5 g. hydrocarbon (b0.1 85-130°). The main fraction (105-10°) was concluded to be satd. and unsatd. C18 hydrocarbons ( $n_{\text{D}20}$  1.462;  $d_{20} 0.849$ ; iodine no. 63, mol. wt. 250  $\pm$  10; C 86.30, H 14.16%). Elution with hexane-EtOH (95:5) gave 2.3 g. of a liquid (acid no. 0; iodine no. 75; sapon. no. 208;  $n_{\text{D}20}$  1.4645). Sapon. of the industrial product (300 g.) with alc.-KOH and extn. with Et2O gave 6.5 g. of a liquid (III) (sapon. no. 8; acid no. 38;  $n_{\text{D}20}$  1.473). Absorption of 2.8 g. of III on alumina and elution with petr. ether gave 1.454 g. (50%) hydrocarbons (IV) (b. 0.1 135°; iodine no. 22,  $n_{\text{D}20}$  1.4580). Elution with petroleum ether-MeOH gave 0.520 g. **O-contg.**

**material**, IV in Me<sub>2</sub>CO at 0° gave hexacosane (m. 55-6°, neg. reaction to (NO<sub>2</sub>)<sub>4</sub>C, mol. wt. 350), and at -30° decosane (recryst. MeOH-Me<sub>2</sub>CO m. 41-2°, mol. wt. 320). The remaining soln. was evapd. in vacuo, and 1.2 g. of the residue (b0.1 120-190°; iodine no. 185; nD<sub>20</sub> 1.4660) reduced with H<sub>2</sub>-Pd. The product (b0.1 80-150 °) gave a neg. reaction with (NO<sub>2</sub>)<sub>4</sub>C. III (1.155 g.) with 2,4-(O<sub>2</sub>N)<sub>2</sub>C<sub>6</sub>H<sub>3</sub>SCl (C.A. 44, 2467b), followed by chromatographing on alumina gave 80% satd. hydrocarbons. Dissolved in Me<sub>2</sub>CO-MeOH (1:1) soln. eicosane crystd. at -30° (m. 33.5-34°; mol. wt. 280). After treatment with concd. H<sub>2</sub>O<sub>4</sub> to remove the last trace of unsatd. compds. 0.200 g. remained (b0.1 105-30°; iodine no. practically zero, nD<sub>20</sub> 1.4572, mol. wt. 240). Analysis of the Raman and ultraviolet spectra of the original hydrocarbon mixt. indicated straight chains and chains having terminal gem dimethyl groupings of C<sub>20</sub>, C<sub>22</sub>, and C<sub>26</sub>. At 0° I formed crystals which gave a pos. Liebermann-Burchardt reaction and were identified as sitosterol (m. 133-4°; [α]<sub>D</sub> -36.4; acetate m. 125-6°, [α]<sub>D</sub> -34.3; benzoate m. 143-3.5°; dinitrobenzoate 207°).

- CC 27 (Fats, Fatty Oils, Waxes, and Detergents)
- IT Hydrocarbons
  - (from peanut-oil **odorous** fraction)
- IT Raman effect
  - (in hydrocarbons, from peanut-oil **odorous** fraction)
- IT Peanut oil or Groundnut oil
  - (**odorous** substances of)
- IT Spectra
  - (of hydrocarbons, from peanut-oil **odorous** fractions)
- IT **Odorous** substances
  - (of peanut oil)
- IT 7782-44-7, Oxygen
  - (compds., from peanut-oil **odorous** fractions)
- IT 2363-88-4, 2,4-Decadienal
  - (from peanut oil **odorous** fractions and identification as 2,4-dinitrophenylhydrazone)
- IT 112-95-8, Eicosane 629-97-0, Docosane 630-01-3, Hexacosane
  - (from peanut-oil **odorous** fraction)
- IT 83-46-5, β-Sitosterol
  - (of peanut-oil **odorous** fractions and identification as acetate, benzoate and dinitrobenzoate)
- IT 66-25-1, Hexanal
  - (prepn. of, from peanut-oil **odorous** fraction and identification as 2,4-dinitrophenylhydrazone)

707993 19540428 (Unavailable). APPLICATION: GB .

AB Aliphatic alcs. free of foreign odor were obtained in high yield from CO and H in a 3-step synthesis: (1) conversion of CO and H over an Fe catalyst to mixts. contg. unsatd. hydrocarbons (I) and over 50% of O-contg. compds. (II), mostly alcs.; (2) addn. of CO and H to I in the presence of II at 120-220° and pressures above 40 atm., catalyzed by aq. solns. of Co salts; (3) catalytic reduction of the products. 1: The Fe catalyst (III) contg. Cu 5, CaO 10, and kieselguhr 10 parts/100 parts Fe, was pptd. from a soln. of the corresponding nitrates with boiling Na<sub>2</sub>CO<sub>3</sub> soln. at pH 9.2, the mother liquor at once removed in a filter press, the cake washed with distd. H<sub>2</sub>O to an alkali content (K<sub>2</sub>O:Fe) of 8.4%, dried to 60% H<sub>2</sub>O content, molded in threads 3.5 mm. thick, dried completely at 110°, comminuted, sieved, and reduced in 90 min. at 310° by a 75% H-25% N mixt. at a linear velocity, cold, of 1.20 m./sec. With III, a mixt. of CO 40, H 50, and inert gases 10 vols. was converted at 198°, 30 kg./sq. cm. pressure and a charge of 100 vols. gas/vol. III/hr., with 1 vol. of fresh gas to 2 vols. of recycled gas used in a 2-cycle operation, conversion being 60% CO + H in each cycle, or 84% total. Between stages, gaseous hydrocarbons, mostly C<sub>3</sub> and C<sub>4</sub> olefins, were removed by an oil wash, about 90% of the CO<sub>2</sub> washed out with H<sub>2</sub>O under pressure, the hydrocarbon distd. from the oil wash and added to the non-aq. phase along with org. compds. distd. from the aq. phase. 2: This mixt. 5 l. was stirred with a CoSO<sub>4</sub> soln. 500 cc. (350 g. CoSO<sub>4</sub>·7H<sub>2</sub>O/l.), heated in a Cr-Ni steel vessel to 140°, treated 50 min. with CO 40, H 50, and inert gases 10 vols. at a pressure up to 190 kg./sq. cm. 3: After the catalyst soln. was removed, a reduced Co catalyst 100 g. was added, the mixt. treated with H at 180-90° and 150 kg./sq. cm. until gas absorption ceased, the catalyst sepd. after 20 min., and the mixt. treated with H at 250° and 200-50 kg./sq. cm. with an oxidie Cu-Cr catalyst. The product showed an ester no. near 0, acid no. <1, HO no. 295. The fraction b. below 380° contained aliphatic alcs. as follows: 30-110°, 90%; 110-220°, 95%; 220-320°, 85-90%; 320-380°, 60-5%. A CoSO<sub>4</sub>-MgSO<sub>4</sub> catalyst soln. was also used in 2 and a Ni-MgO-kieselguhr catalyst in 3. The yield of alcs. was increased 6% when sufficient H<sub>2</sub>O was present during hydrogenation to reduce etherlike compds.

IT 1333-74-0, Hydrogen

(reactions of, with CO in presence of Fe catalyst)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

CC 10 (Organic Chemistry)

IT 1333-74-0, Hydrogen  
(reactions of, with CO in presence of Fe catalyst)

L53 ANSWER 7 OF 13 HCA COPYRIGHT 2004 ACS on STN

49:15874 Original Reference No. 49:3085c-i,3086a-g Paradiprenes. V. Alcohols and ethers of the paradiprene series. Pummerer, Rudolf; Aldebert, Franz; Graser, Fritz; Sperber, Heinrich (Univ. Erlangen, Germany). Ann., 583, 225-39 (Unavailable) 1953. OTHER SOURCES: CASREACT 49:15874.

GI For diagram(s), see printed CA Issue.

AB Paradiprene-dialdehyde (I) (82 g.) with 210 g.  $\text{Al}(\text{OPr-iso})_3$  in 1.05 l. dry iso-PrOH, the resulting  $\text{Me}_2\text{CO}$  rapidly distd., and another 250 cc. iso-PrOH added. After 5 hrs. the mixt. was concd. in vacuo; the following day  $\text{H}_2\text{O}$  was added, the mixt. extd. with  $\text{Et}_2\text{O}$  and the ext. fractionated under N, giving 47 g. 1-hydroxy-4-hydroxymethyl-4-vinylcyclohexene-1 (II), b0.05 129.5-30.5°, sol. in most org. solvents, difficultly sol. in  $\text{C}_6\text{H}_6$ , insol. in petr. ether; bis-(azobenzene-p-carboxylate),  $\text{C}_{36}\text{H}_{32}\text{O}_4\text{N}_4$ , orange, m. 131-4° (from cyclohexane); bis-acid phthalate,  $\text{C}_{26}\text{H}_{24}\text{O}_8$ , m. 139-40°; diacetate, b0.4 132-3°. II (25 g.) hydrogenated in MeOH with  $\text{PtO}_2$  until H had been absorbed gave 19 g. 8,9-dihydro deriv. (III) of II, viscous oil, b0.01 118-21° (other b.ps. given for various preps. are: b0.05-0.1 123-32°, b0.01 109-11°, and b0.3 126-30°); bis-(azobenzene-p-carboxylate) m. 117.5-21°; bis-acid phthalate m. 151-2.5°. III was formed (less satisfactorily) by treating 8,9-dihydroparadipren-7-al-10-ol with  $\text{Al}(\text{OCHMe}_2)_3$ . By hydrogenating II in MeOH repeatedly with especially reactivated  $\text{PtO}_2$ , somewhat impure paradiprene-7,10-diol (IV), viscous oil, b0.01 122-6° was formed in an exceedingly sluggish reaction; bis-(azobenzene-p-carboxylate), m. 141-5° (also given as 139.5-44°); bis-acid phthalate, m. 158-9° (also given as 157-8°). IV (70%) was prepd. more satisfactorily by hydrogenating I in EtOH with Adkins Cu chromite catalyst, at an initial H pressure of 100 atm., at 230-40°. Diacetate of IV, b0.3 115-6°; di-Me ether (from the K alcoholate and MeI), b0.5 60-2°. By hydrogenating I in EtOH, with Adkins reagent at 140-60° and stopping after addn. of 2 moles H, 70% II was formed (giving no crystallizable acid phthalate). Further hydrogenation with Adkins catalyst at 130-50° and 195 to 130 atm. gave III (yielding no crystalline acid phthalate). III (giving low C values, but forming an acid phthalate) was formed by hydrogenating I in EtOH, with Raney Cu at 190-220°, and 210 to 140 atm. H. The diacetate of III b0.3 119-22.5°. II (24 g.) in 128 cc. 87% AcOH, at room temp. was hydrogenated in several stages with  $\text{PtO}_2$  giving 1-hydroxymethyl-1-ethyl-4-methylcyclohexane (V), b10 106-9°,  $n_{\text{D}}^{16.8}$  1.468,  $d_{16.8}$  0.9156, MD 47.44; acid nitrophthalate, m. 183-4° (from cyclohexane- $\text{C}_6\text{H}_6$ );

anthraquinone- $\beta$ -carboxylate, C<sub>25</sub>H<sub>26</sub>O<sub>4</sub>, m. 89-92°; acetate, b<sub>15</sub> 116-16.5°. V was also formed by hydrogenating 8,9-dihydroparadiprenol in AcOH with PtO<sub>2</sub>. The 10-butylacetal (VI) of I, reduced with N<sub>2</sub>H<sub>4</sub>.H<sub>2</sub>O and KOH at 180-210° gave 10-paradiprenal butylacetal, b<sub>0.2</sub> 108-11°, which heated with HCl in MeOH gave paradipren-10-al, C<sub>10</sub>H<sub>14</sub>O (VII), b<sub>12</sub> 80-2°, d<sub>25.5</sub> 0.94078, n<sub>D25.5</sub> 1.480, MD 45.35; semicarbazone, m. 177-8°. Reduced with Al(OPr-iso)<sub>3</sub>. VII gave paradiprene-10-ol (VIII), C<sub>10</sub>H<sub>16</sub>O, b<sub>14</sub> 109-9.5°, d<sub>417</sub> 0.9562, n<sub>D17</sub> 1.4962, MD 46.53; acetate, b<sub>15</sub> 119.5-20.5°; acid 3-nitrophthalate, m. 171°. VIII hydrogenated with Pd-C gave the 8,9-dihydro deriv., b<sub>15</sub> 114.5-15.5°; anthraquinone-2-carboxylate, pale yellow, m. 104-5°. By reducing 158 g. VI with Al(OPr-iso)<sub>3</sub> was formed 94.3 g. of paradiprene-7-ol-10-al butyl acetal, b<sub>1.2</sub> 163-4°, d<sub>414</sub> 0.9717, n<sub>D14</sub> 1.4835, MD 87.2 (at times resinifying on distn.), readily hydrolyzed to the 10-aldehyde (IX), which with N<sub>2</sub>H<sub>4</sub>.H<sub>2</sub>O and KOH gave paradiprene-7-ol (X), b<sub>13</sub> 114-17°; anthraquinone-2-carboxylate, m. 117-20°. X in MeOH with Pd-C gave paradipran-7-ol, C<sub>10</sub>H<sub>20</sub>O, b<sub>15</sub> 115°, with a characteristic **odor**; anthraquinone-2-carboxylate, m. 104-4.5°. The 10-Me acetal of IX (23.3 g.) in abs. PhMe, treated with an alloy of 4 g. K and 2 g. Na, the resulting alcoholate refluxed 1.5 hrs. with MeI gave the Me ether, C<sub>13</sub>H<sub>22</sub>O<sub>3</sub>, b<sub>0.4</sub> 88-90° which on hydrolysis formed 7-methoxy-paradipren-10-al, b<sub>0.2</sub> 63-5° (giving unsatisfactory analyses); semicarbazone, C<sub>12</sub>H<sub>19</sub>O<sub>2</sub>N<sub>3</sub>, m. 107°. In the following reactions, it is assumed that a "retropinacolin" rearrangement occurs. VIII (14.1 g.) in petr. ether was added dropwise to 20 g. PCl<sub>5</sub> in the same solvent at 0°; the mixt. was stirred 4.5 hrs., ice-H<sub>2</sub>O added and the petr. ether layer washed and dried giving 6.65 g. C<sub>10</sub>H<sub>14</sub>Cl (XI), b<sub>2-3</sub> 76.7°, having a characteristic **odor**, not decolorizing Br solns. XI (2 g.) refluxed 1 hr. with 3 g. pyridine and 10 cc. MeOH gave 0.8 g. of an unsatd. compd. (XII) (not analyzed), b<sub>103</sub> 116-26°, still retaining some Cl, which gave pos. reactions with Baeyer's reagent and C(NO<sub>2</sub>)<sub>4</sub> and which decolorized Br in CHCl<sub>3</sub>. XI and 1% KOH in MeOH gave a product similar to XII, b<sub>100</sub> 109-12° (somewhat impure) giving (in AcOH, with AmONO and HCl) very small amts. of a nitrosochloride, C<sub>10</sub>H<sub>8</sub>ONCl, m. 119-20°. XI reacted very slowly with cold H<sub>2</sub>O but rapidly with boiling H<sub>2</sub>O, giving HCl. These reactions indicate that XI cannot be 10-chloro-1,2,8,9-tetrahydro-paradiprene, since such a Cl atom could not be split off readily to form an unsatd. compd. No definite structure is assigned to XI, although several possibilities are suggested. Presumably XI contains a tertiary C atom. Its behavior is similar to that of 1,2-dihydro-1-chloroparadiprene (described in the preceding abstract). IV (84 g.) and KHSO<sub>4</sub> under N (and a slight vacuum) at 150-250° gave a mixt. (XII), b<sub>17-25</sub> 75-135°, contg. a



hydrocarbon, a monohydric alc. and a very volatile O-contg. compd., from which the (unidentified) alc. was removed by distg. over Na. The resulting mixt. (20 g.) was hydrogenated with PtO<sub>2</sub> in AcOH. Neutralized with Na<sub>2</sub>CO<sub>3</sub>, extd. with petr. ether, this ext. extd. with 80-88% H<sub>3</sub>PO<sub>4</sub>, and the acid phase neutralized with Na<sub>2</sub>CO<sub>3</sub>, and then extd. with Et<sub>2</sub>O giving a mixt. (XIII) of ethers, C<sub>10</sub>H<sub>18</sub>O, b<sub>11</sub> 71-80°. XII was also isolated from XII by forming an adduct with ferrocyanic acid, which, after washing with CH<sub>2</sub>Cl<sub>2</sub> and treatment with NaOH gave XIII, b<sub>15</sub> 73-77° (mol. wt. in C<sub>6</sub>H<sub>6</sub>, 151). A possible structure of XIII is (XIIIa). IV (28 g.) at 0.7-1.5 mm., when passed through Al<sub>2</sub>O<sub>3</sub> at 360° gave 7.8 g. of a deep green soln. (contg. azulene?) and a pale yellow fraction C<sub>9</sub>H<sub>14</sub>, b<sub>15</sub> 51.5-3.0°, indicating that IV had lost 2 H<sub>2</sub>O, H, and a CH<sub>2</sub> group. Another fraction, b<sub>13</sub> 60-3° (mol. wt. about 133) was probably a mixt. of C<sub>9</sub>H<sub>14</sub> and C<sub>10</sub>H<sub>16</sub>.

CC 10 (Organic Chemistry)

L53 ANSWER 8 OF 13 HCA COPYRIGHT 2004 ACS on STN

24:25879 Original Reference No. 24:2732e-h Heating of naphthenic acids under pressure. Ipat'ev, V. N.; Petrov, A. D. Ber., 63B, 329-31 (Unavailable) 1930.

AB Naphthenic acids, b. 260-300°, acid no. 233, obtained from Emba petroleum and purified by Honig and Schmitz's method, were heated in 100-cc. portions with 50 cc. H<sub>2</sub>O in a 1-1. autoclave for 5 hrs. at about 400°. The yield of non-aq. product (acid no. 131.4) was about 80%, and the aq. layer was also acid; after neutralization it yielded on the H<sub>2</sub>O bath a few drops of Me<sub>2</sub>CO, and Et<sub>2</sub>O extd. HCO<sub>2</sub>H, AcOH and small amts. of other aliphatic acids. Steam distn. of the non-aq. condensate, after neutralization, gave a light hydrocarbon fraction and an O-contg. neutral fraction, b. 65-260°, with C 85.73-85.91, H 12.60-12.61%, contg. 20% of products sol. in H<sub>2</sub>SO<sub>4</sub> (d. 1.84). The content of neutral O-contg. substances (probably ketones) is therefore only 10-5% at most. After treatment with H<sub>2</sub>SO<sub>4</sub> the 65-260° fraction, washed, dried and distd. from Na gave fractions ranging from b. 80-120°, n<sub>D</sub>21 1.4032, d<sub>25</sub>25 0.7221, C 84.36%, H 15.05%, to b. 250-320°, n<sub>D</sub>21 1.4890, d<sub>25</sub>25 0.8940, C 86.96%, H 12.55%, evidently a mixt. of paraffin and naphthene hydrocarbons, with aromatic hydrocarbons admixed in the higher fractions. The 200-250° fraction of the acid part of the cracking product contained C 65.67, H 10.34% (Ag in Ag salt, 48.54); the 250-300° fraction C 71.29, H 10.71 (Ag, 39.21%); they **smelled** of fatty acids but also probably contained naphthenic acids of lower b. p. than the original acids. Heating the naphthenic acids under H<sub>2</sub> pressure gave analogous results except that the yield of acids was lower, that of benzene correspondingly higher, and that of neutral O-

**contg. compds.** practically nil. The cracking of naphthenic acids with H<sub>2</sub>O under pressure proceeds in 3 directions: (1) cleavage of the CO<sub>2</sub>H and formation of naphthene hydro carbons which in part decomp. into lower carbides; (2) cleavage of the hydrocarbon side chains with formation of naphthenic acids of lower mol. wt.; and (3) cleavage of the side chains contg. the CO<sub>2</sub>H groups with formation of aliphatic acids.

CC 10 (Organic Chemistry)

L53 ANSWER 9 OF 13 HCA COPYRIGHT 2004 ACS on STN

23:30166 Original Reference No. 23:3567h-i,3568a-e Pyrogenous decomposition of wood tar in the presence of hydrogen and under pressure. Ipat'ev, V. N.; Petrov, A. D. Akad. Wiss. Leningrad. Ber., 62B, 401-7 (Unavailable) 1929.

AB Earlier investigation of the pyrogenetic decompn. in the presence of catalysts (Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>) of a series of individual compds. which are constituents of wood tar, justified the assumption that the tar, heated with H<sub>2</sub> under pressure even at the relatively low temp. of 440-80°, would give considerable amounts of benzine and aromatic hydrocarbons as the result partly of cracking and partly of the reduction of unsatd. and **O-contg.**

**compds.** The object of the present work was to study the influence of the conditions on these reactions and to compare the advantages, as regards the formation of the more valuable low-boiling products, of heating with H<sub>3</sub> or of distg. with H<sub>3</sub>PO<sub>4</sub> according to Melamid and Grotzinger. Wood tar contains chiefly (1) alcs. (iso Am, iso-Bu), (2) ketones of the Me<sub>2</sub>CO series and cyclic (satd. and unsatd.) ketones, (3) various phenols and their monoand polyethers, and (4) acids (palmitic, abietic, etc.). Alcs. have been shown to be dehydrated to C<sub>2</sub>H<sub>4</sub> hydrocarbons, which then condense to satd. (hexane, heptane), unsatd. (amylene, hexylene), and polymethylene hydrocarbons. In the presence of **H<sub>2</sub>** there must also be at least a partial conversion into hydrocarbons of the paraffin series. Ketones with open chains are reduced to the corresponding hydrocarbons, and cyclic ketones in the presence of H<sub>2</sub>O react in the same way, as shown with cyclohexanone which, when heated for 24 hrs. at 420-40° with Al<sub>2</sub>O<sub>3</sub> + Fe<sub>2</sub>O<sub>3</sub> and **H<sub>2</sub>** under pressure, gives cyclohexane in good yield. Unsatd. cyclic ketones in the presence of **H<sub>2</sub>** also give phenols besides hydrocarbons; on short heating, the only difference, as compared with heating without **H<sub>2</sub>**, is that the total yield of liquid products is increased, whereas longer heating results in a decreased yield of phenols because of reduction (homoisophorone heated 2 hrs. at 460-80° with **H<sub>2</sub>** gave 40% of phenols). This reduction of the phenols (uni-and bivalent) and their ethers (o-C<sub>6</sub>H<sub>4</sub>(OEt)<sub>2</sub>) heated for 4 hrs. at 430° under **H<sub>2</sub>** that gave 50% of liquid products (chiefly PhOH and C<sub>6</sub>H<sub>6</sub>) is a distinct advantage over the H<sub>3</sub>PO<sub>4</sub> distn. method, in which the

univalent phenols remain unchanged and the bivalent phenols are completely decomposed. The acids with  $\text{Al}_2\text{O}_3$  at  $440-60^\circ$  under  $\text{H}_2$  are easily decomposed, yielding chiefly very low-boiling hydrocarbons almost completely insol. in  $\text{H}_2\text{SO}_4$ . The high-boiling fractions of the wood oil, especially the pitch, may contain, as shown by Benson, decompn. products of abietic acid (retene, chrysene, picene); these homologs of phenanthrene undoubtedly decompose in the same way as phenanthrene itself; in fact,  $\text{C}_{10}\text{H}_6$  and alkylnaphthalenes were identified in the products of the pyrolysis of wood tar (in the absence of  $\text{H}_2$  at atm. pressure,  $\text{C}_{10}\text{H}_8$  is formed only at temps. of bright redness). The products of pyrolysis lack the peculiar unpleasant odor of wood tar; the high-boiling fractions dissolve in part in  $\text{H}_2\text{SO}_4$  but do not darken on standing and can be used as lubricants and for other purpose. Both Kahlbaum's wood tar and a product richer in pitch from the "Vsekolies" Trust were investigated. The results showed that on heating with  $\text{H}_2$  under pressure the total yield of liquid products is larger than on distg. with  $\text{H}_3\text{PO}_4$ ; the % of hydrocarbons and low-boiling fractions is higher; and the % of unsatd. compds. is materially smaller than in cracking without  $\text{H}_2$ . The conditions for obtaining the largest possible yield of liquid products are a temp. of  $440-60^\circ$  and an excess of  $\text{H}_2$  in the presence of catalysts.

CC 22 (Petroleum, Lubricants, Asphalt, and Wood Products)

L53 ANSWER 10 OF 13 HCA COPYRIGHT 2004 ACS on STN

20:22868 Original Reference No. 20:2814g-i,2815a-c Direct synthesis of petroleum hydrocarbons at ordinary pressure. I, II. Fischer, Franz; Tropsch, Hans Ber., 59B, 830-1,832-6 (Unavailable) 1926.

AB With metals of the 8th group as catalysts the catalytic hydrogenation of CO at ordinary pressure yields not  $\text{CH}_4$  alone but a mixt. of  $\text{CH}_4$  with its homologs. By following the reaction quant. it was found that first C derived from the CO is taken up by the catalyst, evidently with carbide formation, and from this carbide, present in the finest state of subdivision, the H regenerates the metal and removes the C as hydrocarbons. The carbides are apparently not the normal, low-C compds. stable at high temps. but compds. rich in C and stable only at relatively low temps., and as a result the C is removed from them not as  $\text{CH}_4$  but as polymembered homologs of  $\text{CH}_4$ . That in this process the hydrocarbons are not formed through  $\text{HCHO}$  or  $\text{MeOH}$  as in the high-pressure catalysis is confirmed by the fact that only hydrocarbons and never O-contg. org. compds. are formed. At temps. such as are used in the high-pressure method, only  $\text{CH}_4$  is formed. Finely divided Co is an efficient catalyst, Fe is slower and Ni is quite weak in the ability to produce hydrocarbons other than  $\text{CH}_4$ . Better than the metals alone are mixts. of them (1-3 parts) with other substances (oxides of Cr, Zn, Be, the rare-earth metals, U, Si, Al,

Mg and Mn, active charcoal and amorphous C in other forms); faintly alkalinizing the Fe metal increases its catalytic activity. The absence of toxic S compds. must be insured. Com. mixts. of CO and H<sub>2</sub> (especially water gas) may be used, S compds. being first removed by catalytic conversion into H<sub>2</sub>S under conditions which will not change the compn. of the gas as regards its other components; such a method of purification will be described elsewhere. With all the gases used (water gas, mixts. poorer and richer in CO, moist CO, etc.) benzine was obtained if they had been sufficiently purified. It is especially important to keep the temp. as low as possible (around 300° with Fe, 270° with Co, 160° with Ni). The higher the velocity of flow the more can the formation of CH<sub>4</sub> be suppressed but the poorer, of course, is the utilization of the gas mixt. A part of the reaction product condenses in liquid form as soon as the reaction mixt. cools and the rest, remaining in the gas in vapor form, is recovered by the usual methods. The condensed products are, depending on conditions, light oils like illuminating oil but may also contain higher boiling oils and deposit solid paraffin. The benzines are H<sub>2</sub>O-clear with a pleasant odor, resembling Pennsylvania benzine, contain only a few % of substances reacting with concd. H<sub>2</sub>SO<sub>4</sub> and do not change at all on standing. The only other products besides hydrocarbons are CO<sub>2</sub> and H<sub>2</sub>O. In an expt. with an Fe-Co catalyst, about 100 g. of liquid and easily liquefiable products was obtained per cu. m. of water gas.

CC 10 (Organic Chemistry)

L53 ANSWER 11 OF 13 HCA COPYRIGHT 2004 ACS on STN

16:3617 Original Reference No. 16:676h,677a-d Chemical action of the electrical discharge. II. Poma, G.; Bassi, G. (Univ. Parma.). Gazzetta Chimica Italiana, 51(II), 71-9 (Unavailable) 1921. CODEN: GCITA9. ISSN: 0016-5603.

AB The phenomena observed on passing an intense explosive elec. discharge through the vapor of a series of org. compds. are described. An induction coil (A) (without the condenser) capable of giving a 300-mm. spark at ordinary pressure with a d.c. of 110 v. was used. A was connected to a milliammeter (B) designed to measure the intensity of high-tension currents. The reaction chamber (D) was connected on both sides to 2 large condensers (C) the plates of which were connected with the secondary of the coil (A). (D) was of glass and contained the organic liquid. The electrode points were horizontally opposite each other and were admitted through long glass side arms. The gas developed in D during the reaction passed through a reflux condenser on top of D, through a wash bottle, through a long coil packed in freezing mixt., through a Dewar flask wash bottle immersed in CO<sub>2</sub> snow + Me<sub>2</sub>CO and finally into a glass balloon (E) with stopcocks at both ends attached by means of a wash bottle to a meter for measuring gas vols. The liquid in D was heated with the open flame and when all the air had been removed the

spark was passed for 1 hr. The cocks on E were closed and the gas (free from the org. liquid used owing to the complete condensation obtained in the intermediate parts) was analyzed by the usual methods. The condensation products in the intermediate receivers were almost entirely composed of the org. liquid used, except traces of a substance with a pungent **odor** resembling that of acrylaldehyde. The detail results are given in tables. The explosive discharge does not cause a sepn. of C in compds. with a low mol. wt. but it appears in compds. with 4 C atoms and then increases on going up the series. C **compds. contg**

. O atoms give rise to H<sub>2</sub>O and various org. compds., the latter, however, in quantities too small for analysis. With MeOH the reaction is nearly quant. MeOH .fwdharw. CO + 2H<sub>2</sub>. On passing up the series there is a progressive increase in the production of C<sub>2</sub>H<sub>2</sub> and CH<sub>4</sub>. Moreover, while the amt. of C<sub>2</sub>H<sub>2</sub> and CO formed depends only on the mol wt. of the alc., the CH<sub>4</sub> and H<sub>2</sub> also formed depend on the constitution. The CH<sub>4</sub> increases with the no. of Me groups in the compd. Formic acid is decomposed in 2 reactions: HCO<sub>2</sub>H .fwdharw. CO<sub>2</sub> + H<sub>2</sub>, 2HCO<sub>2</sub>H .fwdharw. 2CO + 2H<sub>2</sub>O. Vols. of CO<sub>2</sub>:H:CO = 1:1:2. With increase of the mol. wt. of the compd., either by esterification of HCO<sub>2</sub>H or by passing to higher homologs, the amt. of CO<sub>2</sub> diminishes rapidly but not in a regular way.

CC 2 (General and Physical Chemistry)

L53 ANSWER 12 OF 13 HCA COPYRIGHT 2004 ACS on STN

13:3221 Original Reference No. 13:577b-i,578a-c Hydrogenation of aromatic compounds with the aid of platinum. III. Hydrogenation with platinum containing oxygen. Willstatter, Richard; Jaquet, Daniel (Akad. Wiss. Munchen). Ber., 51, 767-79 (Unavailable) 1918.

AB cf. C. A. 7, 1508. Certain reductions, like that of phthalic anhydride (a), which cannot be effected catalytically with Pt free from O, can be initiated by loading the Pt with O and brought to completion by again treating the Pt with O as the catalyst gradually loses its O by the formation of H<sub>2</sub>O. Oxygen-free Pt and that containing O behave like 2 different contact substances in reduction processes. Thus, 20.3 g. (a) in 75 cc. glacial AcOH with 5 g. Pt absorbed only 400 cc. H; if, however, the H gasometer was shut off and the reaction bulb evacuated, then allowed to fill with air, shaken 1 min. (whereupon O was rapidly absorbed -about 5 cc. per g. Pt) and the air was driven out with H, about 500 cc. of H was again absorbed after each such activation until the 20th and 21st times, when the absorption of H was 1230 and 5600 cc., rasp. The total absorption was 17040 cc. (20°, 760 mm.) or, deducting about 1150 cc. used up by the O introduced in the activations, 15890 cc. or 4.8 mols. Of the 2 rings in (a) the 5-membered one is reduced before the C<sub>6</sub>H<sub>6</sub> ring; the first product is phthalide (b) which is partially reduced to hexahydrophthalide (c) and partially to

o-MeC<sub>6</sub>H<sub>4</sub>CO<sub>2</sub>H (d) which is then reduced to the hexahydrotoluic acid (e). If the process is interrupted when only a little H has been absorbed there is obtained, besides some C<sub>6</sub>H<sub>6</sub>(CO<sub>2</sub>H)<sub>2</sub>, a mixt. of (b) and (c), and while (b) is easily reduced further to (d), (c) cannot be reduced to (e). If in the process of isolation alkali is employed the (c) is in part obtained as methylolhexahydrobenzoic acid. Among the reduction products is also cis-hexahydrophthalic acid (f). In the reduction described above were obtained 7 g. (c) (partially hydrolyzed), 7 g. (e) and 4 g. (f). In a similar reduction of (b) 3.4 mols. H were absorbed and there were obtained about equal parts of (e) and (c). Phthalimide behaves quite differently from (a) on reduction, the aromatic nucleus and not the CO groups taking up the O. The activation of the Pt with O is not necessary but the reduction is successful only with the best Pt sponge preps.; many which were active towards C<sub>6</sub>H<sub>6</sub> were inactive towards the imide. Nor can MeOH, EtOH or cyclohexane be used as a solvent; in glacial AcOH the reduction proceeds smoothly. cis-Hexahydrophthalimide seps. from H<sub>2</sub>O, alc. and AcOH in monoclinic prisms, m. 132°. Naphthalic acid purified by crystn. from alc. cannot be reduced because it always contains some anhydride (g) but the acid freshly pptd. from alk. soln. can be reduced; contrary to C<sub>10</sub>H<sub>8</sub>, it takes up only 4 atoms of H; the tetrahydronaphthalic acid (h) seps. in cube-like prisms, m. 196° with loss of H<sub>2</sub>O and conversion into the anhydride, m. 119°. (g), like (a), can be reduced only with Pt activated with O; after about 4 mols. H<sub>2</sub> have been absorbed the reaction slows up. As far as the (g) itself is reduced, the anhydride ring is attacked, but as some of the (g) is hydrolyzed by the H<sub>2</sub>O formed, some (h) is obtained. Among the reduction products are tetrahydro-1-methylnaphthalene-8-carboxylic acid (i), tetra- and decahydronaphthalides and a small amt. of decahydroacenaphthene. The 2 naphthalides could not be isolated pure. The (i) seps. from Et<sub>2</sub>O-petr. ether in needles, m. 150°. o-C<sub>6</sub>H<sub>4</sub>(CO<sub>2</sub>H)<sub>2</sub> is easily reduced in AcOH when entirely free from the anhydride, yielding exclusively the cis-hexahydro acid, m. 191-2°. The p-acid in AcOH suspension is reduced much more rapidly on gentle warming, giving about equal parts of the cis- and cis-trans-hexahydro acids, m. 162-3° and about 300°, resp. The m-acid, if pure, is likewise easily reduced in AcOH suspension, forming chiefly the cis- and some cis-trans-hexahydro acid. p-Toluylic acid very quickly gives exclusively or almost exclusively the liquid hexahydro acid whose amide m. 175-6°. Indole in AcOH smoothly absorbs 8 atoms H with formation of perhydroindole, b<sub>720</sub> 182-3°, b<sub>12</sub> 65°, a basic oil of medium consistency and unpleasant, penetrating, onion-like odor, d<sub>420</sub> 0.9947; chloroplatinate, reddish yellow monoclinic tablets from alc., m. 172-3° (not sharply); picrate, fine needles from alc., m. 137-8° (not sharply). If the reduction is interrupted before

it is complete (e. g., when 2 atoms of H have been absorbed), the product contains unchanged indole, dihydroindole and perhydroindole, the last being removed by shaking the Et<sub>2</sub>O soln. with 0.1 N HCl until the alk. reaction just disappears, and the first two being sepd. by fractional pptn. from Et<sub>2</sub>O with picric acid.

CC 10 (Organic Chemistry)

IT Hydrogenation

(of aromatic **compds.** with Pt **contg.** O  
)

L53 ANSWER 13 OF 13 HCA COPYRIGHT 2004 ACS on STN

7:18308 Original Reference No. 7:2664b-f The Essential Oil of *Crithmum maritimum* of Sardinia. I. Francesconi, L.; Surnagiotto, E. (Univ. Cagliari). *Atti della Accademia Nazionale dei Lincei, Classe di Scienze Fisiche, Matematiche e Naturali, Rendiconti*, 22(I), 231-7 (Unavailable) 1913. CODEN: AANLAW. ISSN: 0001-4435.

AB When collecting *Seseli bocconi* (from Carloforte) (C. A., 6, 137, 624) a closely related *umbellifera*, *Crithmum maritimum* was observed, the essential oil of which (from Charente) has been studied (Borde, C. A., 4, 2181; *Del. acte. epine*, C. A., 4, 2863). Since  $\beta$ -phellandrene was found in *Seseli* it was sought for in *Crithmum* from the same locality. 120 kg. of the whole plant gave 110 g. of the essential oil having an **odor** of parsley, d. less than H<sub>2</sub>O, yellowish red color, slightly acid in reaction; sapon. no., 5.19, Ac no. 9.40, and small amts. of esters and free alcs., as well as traces of phenols (C: O **compds.** were not found); H<sub>2</sub>SO<sub>4</sub> + Ac<sub>2</sub>O gave a wine-red coloration. When distilled in a **H atm.** 2 fractions were obtained: that with high b. p. is red, turbid and denser than H<sub>2</sub>O, that with the low b. p. is colorless, d<sub>20</sub> 0.8871,  $[\alpha]_D^{20}$  6.05°, n<sub>D</sub> 1.4813. The latter was fractionated in an **atm.** of **H** into 7 fractions, b. 175-187°, n<sub>D</sub> 1.4724-1.4877 and  $[\alpha]_D^{20}$  11.99°-0.00°. The whole plant from Cagliari (Capo S. Elia), 188 kg., gave 300 g. of the oil on distilling with steam: d<sub>20</sub> 0.9816,  $[\alpha]_D^{20}$  3.18°, n<sub>D</sub> 1.497, acidity almost none, sapon. no. 6.50, Ac no. 11.24, color and **odor** as above and **contains** some O **compd.** Distilling slowly in H<sub>2</sub>O vapor gave a volatil portion (d. 0.8611, n<sub>D</sub> 1.4761,  $[\alpha]_D^{20}$  5.83°, sapon. no. 6.5, Ac no. 11.24) and a non-volatil portion (d. 1.1453,  $[\alpha]_D^{20}$  1.5249, sapon. no. 7.51, Ac no. 12.11). The former in fractionating in **H** at 25 mm. gave 4 fractions which on analysis corresponded approximately to C<sub>10</sub>H<sub>16</sub>. The essential oil of the flowers, leaves, stems and seeds were studied as above separately: the yield was largest in the seeds and smallest in the stems. The ratio of the terpene-like **compds.** (volatil) to the non-volatil varies (blossoms 3 : 1, leaves 1 : 1, stems 4 : 5). The O **compd.** was present in the non-volatil part. The esters and alcs. are almost equally divided. The volatil part

evidently contains 2 terpenes but the low optical rotation, high n and high b. p exclude the possibility of the presence of d-pitene as found by Del. acte. epine.

CC 17 (Pharmaceutical Chemistry)

=> d 154 1-47 ti

- L54 ANSWER 1 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Measurement of fish freshness using potentiometric gas sensor
- L54 ANSWER 2 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Contribution of dissolved sulfates and sulfites in hydrogen sulfide emission from stagnant water bodies in Sri Lanka
- L54 ANSWER 3 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Performance of a full-scale biotrickling filter treating H<sub>2</sub>S at a gas contact time of 1.6 to 2.2 seconds
- L54 ANSWER 4 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Probing green algal hydrogen production
- L54 ANSWER 5 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Decomposition of CH<sub>3</sub>SH in an RF Plasma Reactor: Reaction Products and Mechanisms
- L54 ANSWER 6 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Morning breath **odor**: influence of treatments on sulfur gases
- L54 ANSWER 7 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Emission of reduced malodorous sulfur gases from wastewater treatment plants
- L54 ANSWER 8 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Application of packed scrubbers for air emissions control in municipal wastewater treatment plants
- L54 ANSWER 9 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Deodorants for air purification
- L54 ANSWER 10 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Deodorization of gases with coffee grounds
- L54 ANSWER 11 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Configurational design of semiconductor thick film sensors for **odor** sensing



- L54 ANSWER 12 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Deodorization of flue gases by catalytic decomposition
- L54 ANSWER 13 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI **Smell** sensor using aluminum-doped zinc oxide thin film prepared by sputtering technique
- L54 ANSWER 14 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Catalysts for oxidative decomposition of **odorous** components in waste gases or polluted air.
- L54 ANSWER 15 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Deodorization and disinfection of indoor air using ozone
- L54 ANSWER 16 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Current topics of gas sensors
- L54 ANSWER 17 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Quantification of **aroma** compounds using a stable isotope dilution assay
- L54 ANSWER 18 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Detection of offensive **odor** using zinc oxide thick film type gas sensor
- L54 ANSWER 19 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Apparatus and method for deodorization of **odorous** gases using ozone
- L54 ANSWER 20 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Measurements of **odorous** substance in effluent
- L54 ANSWER 21 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Air deodorization using ozone
- L54 ANSWER 22 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Treatment of waste gas
- L54 ANSWER 23 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Comparison of compositions of **odor** components of natto and cooked soybeans
- L54 ANSWER 24 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Dry scrubbing of kraft recovery furnace stack gases for the removal of **odoriferous** reduced sulfur compounds and particulates:  
Part II - Pilot plant tests
- L54 ANSWER 25 OF 47 HCA COPYRIGHT 2004 ACS on STN

- TI Calculation of solvent interaction energies using empirical and semiempirical methods
- L54 ANSWER 26 OF 47 HCA COPYRIGHT 2004 ACS on STN
- TI Activated sludge deodorization of malodorous gases emitted from fish meal plant
- L54 ANSWER 27 OF 47 HCA COPYRIGHT 2004 ACS on STN
- TI Concentration of **odorous** materials in environment
- L54 ANSWER 28 OF 47 HCA COPYRIGHT 2004 ACS on STN
- TI Deodorizing catalyst for ozone oxidation of drainage malodor
- L54 ANSWER 29 OF 47 HCA COPYRIGHT 2004 ACS on STN
- TI **Odor** abatement with acidic potassium permanganate solutions
- L54 ANSWER 30 OF 47 HCA COPYRIGHT 2004 ACS on STN
- TI Gas chromatographic examination of air in livestock enclosures
- L54 ANSWER 31 OF 47 HCA COPYRIGHT 2004 ACS on STN
- TI **Odor** removal from **sulfur compound-containing** gases
- L54 ANSWER 32 OF 47 HCA COPYRIGHT 2004 ACS on STN
- TI Production and transport of **gaseous** ammonia and **hydrogen** sulfide associated with livestock production
- L54 ANSWER 33 OF 47 HCA COPYRIGHT 2004 ACS on STN
- TI Scrubbing malodorous gases with glycerol and hydrogen peroxide to remove ammonia, hydrogen sulfide, and mercaptans
- L54 ANSWER 34 OF 47 HCA COPYRIGHT 2004 ACS on STN
- TI Deodorization of pulping waste **gas** containing **hydrogen** sulfide and organic sulfur compounds
- L54 ANSWER 35 OF 47 HCA COPYRIGHT 2004 ACS on STN
- TI Direct gas chromatographic analysis of sulfur compounds in mouth air in man
- L54 ANSWER 36 OF 47 HCA COPYRIGHT 2004 ACS on STN
- TI Differences in the composition of the alcohol obtained from molasses in comparison with one obtained from grains and potatoes
- L54 ANSWER 37 OF 47 HCA COPYRIGHT 2004 ACS on STN
- TI Reactions of amines with pentaborane
- L54 ANSWER 38 OF 47 HCA COPYRIGHT 2004 ACS on STN

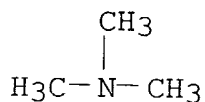
- TI Thiosulfate compounds of platinum
- L54 ANSWER 39 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Experiments in the utilization of benzene fore-runings
- L54 ANSWER 40 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Oil refining with  $\text{AlCl}_3$
- L54 ANSWER 41 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Sensitive test for sulfur by means of nascent hydrogen
- L54 ANSWER 42 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI New complex compounds of mercury and copper halides with aliphatic amines
- L54 ANSWER 43 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI New reduction products resulting from the condensation of sugars and aliphatic amines
- L54 ANSWER 44 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Berginization of some coals and tars
- L54 ANSWER 45 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI The menthol series. Hydrogenation of pulegone
- L54 ANSWER 46 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Producing gasolines from shale oil
- L54 ANSWER 47 OF 47 HCA COPYRIGHT 2004 ACS on STN  
TI Synthesis of homomorpholine and of benzohomomorpholine

=> d 154 1,6,7,8,9,10,12,14,15,19,20,21,22,26,27,28,41 cbib abs hitstr  
hitind

- L54 ANSWER 1 OF 47 HCA COPYRIGHT 2004 ACS on STN  
141:37705 Measurement of fish freshness using potentiometric gas sensor.  
Kaneki, Noriaki; Tanaka, Hirotoshi; Kurosaka, Tadahiro; Shimada,  
Kouji; Asano, Yasukazu (Muroran Institute of Technology, Muroran,  
050-8585, Japan). Sensors and Materials, 15(8), 413-422 (English)  
2003. CODEN: SENMER. ISSN: 0914-4935. Publisher: Scientific  
Publishing Division of MYU K.K..
- AB A system of potentiometric gas sensors was used to measure the  
**odor** emitted from decomp. fish to evaluate fish freshness.  
An oxidn.-redn. gas sensor has been developed by us for the emitted  
gas measurement. The authors have evaluated the basic responses of  
multiple sensor systems comprising an oxidn.-redn. gas sensor  
developed by us, an ammonia gas sensor and a **hydrogen**

sulfide **gas** sensor with regard to the indicator component of the **odor** emitted from decomp. fish. These sensors showed characteristic responses for dimethylamine (DMA) and **trimethylamine** (TMA) that are assumed to be the products of fish decompn. When applied to the measurement of the **odor** of salmon and sardine, the system was able to detect the characteristic signals from individual sensors with regard to the fish decompn. The output patterns of these sensors were evaluated by the sensory test and the colony count method. The deterioration of fish quality with time could be identified by a method of principal component anal. using the signals from the 3 /sensors. Therefore, it was indicated that fish freshness can be evaluated using three potentiometric gas sensors.

IT 75-50-3, **Trimethylamine**, analysis  
 (fish freshness measured by potentiometric gas sensor)  
 RN 75-50-3 HCA  
 CN Methanamine, N,N-dimethyl- (9CI) (CA INDEX NAME)



CC 17-1 (Food and Feed Chemistry)  
 ST dimethylamine **trimethylamine** fish off **odor**  
 potentiometric gas sensor; fish freshness food analysis  
 potentiometric gas sensor  
 IT **Odor** and **Odorous** substances  
 (off-**odor**; fish freshness measured by potentiometric  
 gas sensor)  
 IT 75-50-3, **Trimethylamine**, analysis 124-40-3,  
 Dimethylamine, analysis  
 (fish freshness measured by potentiometric gas sensor)

L54 ANSWER 6 OF 47 HCA COPYRIGHT 2004 ACS on STN

134:348217 Morning breath **odor**: influence of treatments on sulfur gases. Suarez, F. L.; Furne, J. K.; Springfield, J.; Levitt, M. D. (ACOS for Research Office, The Minneapolis Veterans Affairs Medical Center, Minneapolis, MN, 55417, USA). Journal of Dental Research, 79(10), 1773-1777 (English) 2000. CODEN: JDREAF. ISSN: 0022-0345. Publisher: International Association for Dental Research.

AB This work assessed the effects of several treatments on the concns. of oral **S-contg.** gases, **compds.** thought to be responsible for morning breath **odor**. Upon awakening in the morning, healthy volunteers collected oral gas samples before and for 8 h after the following treatments: no treatment, brushing the teeth with toothpaste, brushing the tongue,

rinsing with 5 mL of 3% H<sub>2</sub>O<sub>2</sub>, breakfast ingestion, or swallowing two BreathAsure capsules. The gas samples were analyzed for S-contg. volatiles by gas chromatog. Basal collections usually contained three sulfur gases: H<sub>2</sub>S, MeSH, and Me<sub>2</sub>S. The effectiveness of a treatment was detd. by comparison of the areas under the gas concn.-time curves with and without treatment. Brushing the teeth or ingestion of BreathAsure had no apparent influence on the S gases. Ingestion of breakfast and tongue brushing resulted in strong trends toward decreased S gases. H<sub>2</sub>O<sub>2</sub> reduced the S gas concns. for 8 h.

CC 1-12 (Pharmacology)

ST breath **odor** sulfur contg gas treatment; halitosis sulfur contg **gas hydrogen** peroxide treatment

IT Mouth

(halitosis; morning breath **odor** of humans: treatments effect on sulfur-contg. gases)

IT Tooth

(morning breath **odor** of humans: brushing the teeth effect on sulfur-contg. gases)

IT Tongue

(morning breath **odor** of humans: brushing the tongue effect on sulfur-contg. gases)

IT Respiratory air

(morning breath **odor** of humans: treatments effect on sulfur-contg. gases)

IT 7722-84-1, Hydrogen peroxide, biological studies

(morning breath **odor** of humans: hydrogen peroxide effect on sulfur-contg. gases)

IT 74-93-1, Methanethiol, biological studies 75-18-3, Dimethyl sulfide 7704-34-9, Sulfur, biological studies 7783-06-4, Hydrogen sulfide, biological studies

(morning breath **odor** of humans: treatments effect on sulfur-contg. gases)

L54 ANSWER 7 OF 47 HCA COPYRIGHT 2004 ACS on STN

130:342043 Emission of reduced malodorous sulfur gases from wastewater treatment plants. Devai, Istvan; DeLaune, Ronald D. (Wetland Biogeochemistry Institute, Louisiana State University, Baton Rouge, LA, 70803-7511, USA). Water Environment Research, 71(2), 203-208 (English) 1999. CODEN: WAERED. ISSN: 1061-4303. Publisher: Water Environment Federation.

AB The emission of malodorous gaseous compds. from wastewater collection and treatment facilities is a growing maintenance and environmental problem. Numerous gaseous compds. with low **odor** detection thresholds are emitted from these facilities. Sulfur-bearing gases represent compds. with the lowest **odor** detection threshold. Using solid adsorbent preconcn. and gas chromatog. methods, the quantity and compn. of reduced malodorous

sulfur gases emitted from various steps of the treatment process were detd. in wastewater treatment plants in Baton Rouge, Louisiana. Hydrogen sulfide, which is a malodorous, corrosive, and toxic gas, was the most dominant volatile reduced sulfur (S) compd. measured (concn. range: 0.017 to 446.9 µg S/L). Concns. were not only more than the **odor** detection threshold of hydrogen sulfide, but above levels that may affect health during long-term exposure. The concns. of methanethiol (0.008 to 8.7 µg S/L), Me<sub>2</sub>S (0.003 8 to 26.4 µg S/L), CS<sub>2</sub> (0.006 to 5.70 µg S/L), and carbonyl sulfide (0.005 to 7.30 µg S/L) were significantly less than hydrogen sulfide. However, even though emissions of reduced sulfur **gases** other than **hydrogen** sulfide were low, previous studies suggested that long-term exposure to such levels may cause respiratory problems and other symptoms.

IT 7704-34-9D, Sulfur, reduced compds., occurrence  
(emission of malodorous reduced sulfur compd. gases from  
wastewater treatment plants in Baton Rouge, Louisiana)  
RN 7704-34-9 HCA  
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

CC 59-2 (Air Pollution and Industrial Hygiene)  
Section cross-reference(s): 60

IT Air pollution  
**Odor** and **Odorous** substances  
Wastewater treatment

(emission of malodorous reduced sulfur compd. gases from  
wastewater treatment plants in Baton Rouge, Louisiana)  
IT 74-93-1, Methanethiol, occurrence 75-15-0, Carbon disulfide,  
occurrence 75-18-3, Dimethyl sulfide 463-58-1, Carbon oxide  
sulfide (COS) 7704-34-9D, Sulfur, reduced compds.,  
occurrence 7783-06-4, Hydrogen sulfide (H<sub>2</sub>S), occurrence  
(emission of malodorous reduced sulfur compd. gases from  
wastewater treatment plants in Baton Rouge, Louisiana)

L54 ANSWER 8 OF 47 HCA COPYRIGHT 2004 ACS on STN

128:274400 Application of packed scrubbers for air emissions control in  
municipal wastewater treatment plants. Basu, Somnath; Gu, Zhong  
Chun; Shilinsky, Kenneth A. (Deer Island Treatment Plant, MWRA,  
Winthrop, MA, 02152, USA). Environmental Progress, 17(1), 9-18  
(English) 1998. CODEN: ENVPDI. ISSN: 0278-4491. Publisher:  
American Institute of Chemical Engineers.

AB The process air emissions from municipal wastewater treatment plants  
contain primarily **hydrogen** sulfide **gas**, along  
with other organosulfur compds., and some trace quantities of  
volatile org. compds. (VOCs). Various Federal and(or) State

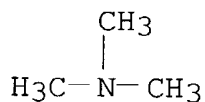
Regulations require monitoring of these emissions and control down to some specified levels. At the Deer Island Wastewater Treatment Plant of the Massachusetts Water Resources Authority (MWRA), air contg. hydrogen sulfide is collected and treated in several emission control systems. These systems consist of wet scrubbers which facilitate destruction of **hydrogen sulfide gas** and the related **odor** by continuously contacting the collected air countercurrently with a strong oxidizing soln. of sodium hypochlorite. This paper discusses the performance of a typical scrubber in light of the theory of absorption followed by chem. reaction. Based on an anal. of a set of test data, it has been concluded that when the concn. of hydrogen sulfide at a scrubber inlet exceeds 25 ppm, the scrubber becomes mass transfer limited. This can lead to the incomplete oxidn. of **hydrogen sulfide gas**. Unreacted H<sub>2</sub>S eventually can exit the scrubber, while partially oxidized H<sub>2</sub>S, in the form of elemental sulfur, can deposit on, and eventually foul, the packing media. Measures taken to overcome such a situation are also reported.

IT 7704-34-9D, Sulfur, org. compds., processes  
 (application of packed scrubbers to treatment of municipal wastewater treatment plant **odorous** waste gas)  
 RN 7704-34-9 HCA  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

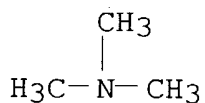
CC 59-4 (Air Pollution and Industrial Hygiene)  
 Section cross-reference(s): 60  
 ST hydrogen sulfide wet scrubbing waste gas; hypochlorite scrubbing  
**hydrogen** sulfide waste **gas**; wastewater treatment  
 offgas hydrogen sulfide removal  
 IT Mass transfer  
**Odor** and **Odorous** substances  
 Waste gases  
 Wastewater treatment  
 Wet scrubbing  
 (application of packed scrubbers to treatment of municipal wastewater treatment plant **odorous** waste gas)  
 IT Volatile organic compounds  
 (application of packed scrubbers to treatment of municipal wastewater treatment plant **odorous** waste gas)  
 IT Air pollution  
 (control; application of packed scrubbers to treatment of municipal wastewater treatment plant **odorous** waste gas)  
 IT Organic **compounds**, processes  
 (**sulfur-contg.**; application of packed scrubbers to treatment of municipal wastewater treatment plant

- odorous waste gas)**
- IT 7681-52-9, Hypochlorous acid, sodium salt  
(application of packed scrubbers to treatment of municipal wastewater treatment plant **odorous waste gas)**
- IT 7704-34-9D, Sulfur, org. compds., processes 7783-06-4,  
Hydrogen sulfide (H<sub>2</sub>S), processes  
(application of packed scrubbers to treatment of municipal wastewater treatment plant **odorous waste gas)**
- L54 ANSWER 9 OF 47 HCA COPYRIGHT 2004 ACS on STN  
124:351293 Deodorants for air purification. Seo, Sumimasa; Iguchi, Tsutomu (Nippon Kayaku Kk, Japan). Jpn. Kokai Tokkyo Koho JP 08066464 A2 19960312 Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-226101 19940829.
- AB The title deodorants contain Mn, Zr, Cu metal or their compds. loaded on silica support for removing **odorous gases** (e.g., hydrogen sulfide, Me mercaptan, tri-Me amine).
- IT 75-50-3, Trimethyl amine, processes  
(deodorants for air purifn.)
- RN 75-50-3 HCA
- CN Methanamine, N,N-dimethyl- (9CI) (CA INDEX NAME)

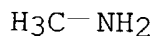


- IC ICM A61L009-01
- CC 59-6 (Air Pollution and Industrial Hygiene)
- IT 74-93-1, Methyl mercaptan, processes 75-50-3, Trimethyl amine, processes 7783-06-4, Hydrogen sulfide, processes  
(deodorants for air purifn.)
- L54 ANSWER 10 OF 47 HCA COPYRIGHT 2004 ACS on STN  
122:88187 Deodorization of gases with coffee grounds. Kiryama, Koichi (Ebara Infilco, Japan; Ebara Sogo Kenkyusho Kk). Jpn. Kokai Tokkyo Koho JP 06296822 A2 19941025 Heisei, 3 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-109785 19930414.
- AB The process comprises passing the **odor-contg. gases** through dried, carbonized, and/or chem.-treated coffee grounds. The process is useful for removal of sulfides, NH<sub>3</sub>, amines, etc. from gases in wastewater treatment plants, etc.
- IT 75-50-3, **Trimethylamine**, processes  
(**gas** deodorization with coffee grounds)
- RN 75-50-3 HCA
- CN Methanamine, N,N-dimethyl- (9CI) (CA INDEX NAME)





- IC ICM B01D053-34  
ICS B01D053-34; B01J020-24
- CC 59-4 (Air Pollution and Industrial Hygiene)  
Section cross-reference(s): 17, 60
- IT 74-93-1, Methyl mercaptan, processes 75-18-3, Methyl sulfide  
**75-50-3, Trimethylamine**, processes 624-92-0,  
Dimethyl disulfide 7664-41-7, Ammonia, processes 7783-06-4,  
**Hydrogen** sulfide, processes  
(gas deodorization with coffee grounds)
- L54 ANSWER 12 OF 47 HCA COPYRIGHT 2004 ACS on STN  
119:14547 Deodorization of flue gases by catalytic decomposition.  
Yoshimoto, Masafumi; Nakatsuji, Tadao; Yoshida, Kimihiko (Sakai  
Chemical Industry Co, Japan). Jpn. Kokai Tokkyo Koho JP 05064654 A2  
19930319 Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP  
1991-87162 19910124.
- AB Flue gases contg. **odorous** compds. (e.g., NH<sub>3</sub>, H<sub>2</sub>S, amines  
and thiols) are treated by decompn. with O<sub>3</sub> over a catalyst contg.  
(a) ≥1 oxides of Mn, Fe, Co, Ni, Cu, and Ag, (b) ≥1  
oxides, hydroxides and carbonates of alkali metal or alk. earth  
metals, and (c) activated C at 10-30°. Thus, an  
**odorous** gas contg. 5 ppm MeNH<sub>2</sub> was dosed with 10 ppm O<sub>3</sub> over  
a catalyst contg. NiO 70, CaO 20 and activated C 180 wt. ratio at  
20° and 2000 h<sup>-1</sup> **gas** space velocity,  
resulting in the MeNH<sub>2</sub> decompn. of 95.6%.
- IT **74-89-5**, Methyl amine, miscellaneous  
(removal of, from **odorous** gases, by catalytic decompn.  
with ozone)
- RN 74-89-5 HCA
- CN Methanamine (9CI) (CA INDEX NAME)



- IC ICM A61L009-015  
ICS B01D053-34; B01D053-36
- CC 59-4 (Air Pollution and Industrial Hygiene)
- IT 10028-15-6, Ozone, uses  
(decompn. with, of **odorous** flue gases, catalysts for)
- IT **74-89-5**, Methyl amine, miscellaneous 74-93-1, Methyl  
mercaptan, miscellaneous 75-07-0, Acetaldehyde, miscellaneous  
79-09-4, Propionic acid, miscellaneous 7664-41-7, Ammonia,  
miscellaneous 7783-06-4, Hydrogen sulfide, miscellaneous

(removal of, from **odorous** gases, by catalytic decompn. with ozone)

L54 ANSWER 14 OF 47 HCA COPYRIGHT 2004 ACS on STN

117:257296 Catalysts for oxidative decomposition of **odorous** components in waste gases or polluted air.. Watanabe, Noriko; Yamashita, Hisao; Kato, Akira; Matsuo, Yoshio; Akama, Hiroshi (Hitachi, Ltd., Japan; Babcock-Hitachi K. K.). Jpn. Kokai Tokkyo Koho JP 04200638 A2 19920721 Heisei, 14 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1990-328934 19901130.

AB **Odorous** air or waste gases contg. amines, thiols, aldehydes, NH<sub>3</sub> and H<sub>2</sub>S, etc. are treated by oxidative decompn. with a catalyst contg. (5-50):(50-95) at. ratio Ag/Mn oxides, and other active metals on a honeycomb support at 200-900°, preferably 300-600°. The honeycomb support has a sp. surface area of 0.5-1000 m<sup>2</sup>/g and can be made of alumina, TiO<sub>2</sub>, zeolite, silica, cordierite, or metals. Thus, an **odorous** air contg. 50 ppm acetaldehyde and 50 ppm **trimethylamine** was reacted over the catalyst contg. Ag<sub>2</sub>O/Mn<sub>2</sub>O ratio 20:80 on an alumina-sputtered steel honeycomb support at 3000 h<sup>-1</sup> **gas** space velocity, resulting in the removal of 80% acetaldehyde and 90% **trimethylamine**.

IT 75-50-3, **Trimethylamine**, miscellaneous  
(removal of, from **odorous** air or waste gases, by oxidative decompn., catalysts for)

RN 75-50-3 HCA

CN Methanamine, N,N-dimethyl- (9CI) (CA INDEX NAME)

CH<sub>3</sub>

H<sub>3</sub>C-N-CH<sub>3</sub>

IC ICM B01J023-68

ICS B01D053-36

CC 59-4 (Air Pollution and Industrial Hygiene)  
Section cross-reference(s): 67

IT Aldehydes, miscellaneous

Amines, miscellaneous

Thiols, miscellaneous

(removal of, from **odorous** air or waste gases, by oxidative decompn., catalysts for)

IT 74-93-1, Methanethiol, miscellaneous 75-07-0, Acetaldehyde, miscellaneous 75-50-3, **Trimethylamine**, miscellaneous 7664-41-7, Ammonia, miscellaneous 7783-06-4, Hydrogen sulfide, miscellaneous

(removal of, from **odorous** air or waste gases, by oxidative decompn., catalysts for)

L54 ANSWER 15 OF 47 HCA COPYRIGHT 2004 ACS on STN

117:96560 Deodorization and disinfection of indoor air using ozone.

Aibe, Norio (Takeda Chemical Industries, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 04029718 A2 19920131 Heisei, 7 pp. (Japanese).

CODEN: JKXXAF. APPLICATION: JP 1990-136528 19900525.

AB The title method comprises (1) contacting  $\geq 1$  portion of **odorous** air and/or atm. air with an acid-loaded adsorbent at 5-80° and 500-100,000 h<sup>-1</sup> **gas** space velocity to selectively remove NH<sub>3</sub> and amines, (2) passing the treated air through corona-discharge electrodes to generate O<sub>3</sub>, (3) mixing the ozonized air with the remaining portion of **odorous** air in a H<sub>2</sub>O<sub>2</sub>-contg. water at  $\geq 200$  rpm, preferably 1000-7000 rpm, and (4) further contacting the air mixt. with an inorg.-series catalyst on a filter to decomp. residual O<sub>3</sub>. Thus, a portion of **odorous** air contg. H<sub>2</sub>S 0.15, MeSH 0.05, (Me)<sub>2</sub>S 0.03, (Me)<sub>2</sub>S<sub>2</sub> 0.01, NH<sub>3</sub> 1.3, and MeNH<sub>2</sub> 0.03 ppm was contacted with a 15% citric acid-loaded activated C adsorbent at 3.5-16 L/min, and then passed through the corona-discharge electrodes to give an ozonized air, which was then mixed with the remaining portion of **odorous** air in a cyclone fan at 1800 rpm. The air mixt. was then passed through a filter bed loaded with 5 wt.% MnO<sub>2</sub> and 5 wt.% K<sub>2</sub>CO<sub>3</sub> on cordierite honeycomb supports at a linear flow of 40 cm/s to obtain a clean air.

IT 74-89-5, **Methylamine**, miscellaneous  
(removal of, from **odorous** air, by ozonization, app.  
for)

RN 74-89-5 HCA

CN Methanamine (9CI) (CA INDEX NAME)

H<sub>3</sub>C-NH<sub>2</sub>

IC ICM B01D053-34

ICS A23L003-3445; A61L009-015; B01D053-32; B01D053-36; C01B013-11

CC 59-6 (Air Pollution and Industrial Hygiene)

IT 74-89-5, **Methylamine**, miscellaneous 74-93-1,  
Methyl mercaptan, miscellaneous 75-18-3, Dimethyl sulfide  
624-92-0, Dimethyl disulfide 7664-41-7, Ammonia, miscellaneous  
7783-06-4, Hydrogen sulfide, miscellaneous  
(removal of, from **odorous** air, by ozonization, app.  
for)

L54 ANSWER 19 OF 47 HCA COPYRIGHT 2004 ACS on STN

114:128239 Apparatus and method for deodorization of **odorous**

gases using ozone. Aibe, Norio (Takeda Chemical Industries, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 02258015 A2 19901018 Heisei, 11 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1989-298134

19891115. PRIORITY: JP 1988-327252 19881223.

- AB The title app. comprises an ozonizer with UV lamps, an air blower for high-speed mixing the formed O<sub>3</sub> with **odorous** gases in a cylindrical chamber, means for contacting the gas mixt. with water or H<sub>2</sub>O<sub>2</sub>-contg. water, means for sepg. the liq. phase from the treated gases, means for passing the treated gases through a fixed bed of inorg. catalysts to adsorb-decomp. the residual **odorous** components and residual O<sub>3</sub>, and means for removing spent catalyst fines and other solid residues from the treated gases. Thus, an **odorous** gas contg. H<sub>2</sub>S 0.3, MeSH 0.1, (Me)<sub>2</sub>S 0.1, (Me)<sub>2</sub>S<sub>2</sub> 0.1, NH<sub>3</sub> 0.5, MeNH<sub>2</sub> 0.2 and HCHO 1.0 ppm was treated with 6 ppm O<sub>3</sub>, stirred at 1800 rpm and 38000 h-1 **gas** space velocity, and passed through an activated carbon honeycomb (pore d. 450 cells/in.<sup>2</sup>), then an Fe oxide-Mn oxide honeycomb for .apprx.5 h. The treated gas contained no malodors.
- IT 74-89-5, **Methylamine**, uses and miscellaneous (removal of, from **odorous** gases, by catalytic decompn. with ozone, app. for)
- RN 74-89-5 HCA
- CN Methanamine (9CI) (CA INDEX NAME)

H<sub>3</sub>C-NH<sub>2</sub>

- IC ICM B01D053-36  
ICS B01D053-34
- CC 59-4 (Air Pollution and Industrial Hygiene)
- IT 50-00-0, Formaldehyde, uses and miscellaneous 74-89-5, **Methylamine**, uses and miscellaneous 74-93-1, Methyl mercaptan, uses and miscellaneous 75-18-3, Dimethyl sulfide 624-92-0, Dimethyl disulfide 7664-41-7, Ammonia, uses and miscellaneous 7783-06-4, Hydrogen sulfide, uses and miscellaneous (removal of, from **odorous** gases, by catalytic decompn. with ozone, app. for)

L54 ANSWER 20 OF 47 HCA COPYRIGHT 2004 ACS on STN

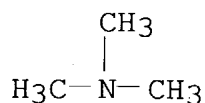
111:83536 Measurements of **odorous** substance in effluent.

Taguchi, Hiromichi (Shizuoka Prefect. Inst. Public Health Environ. Sci., Shizuoka, 420, Japan). Gijutsu Joho - Shizuoka-ken Eisei Kankyo Senta, 7(1), 9-12 (Japanese) 1989. CODEN: GJSSE7.

- AB Concns. of H<sub>2</sub>S, MeSH, Me<sub>2</sub>S<sub>2</sub>, NH<sub>3</sub>, and MeN in wastewater were measured. Wastewater samples were collected at 7 treatment facilities such as pulp mill and night soil treatment facility. H<sub>2</sub>S, MeSH, and Me<sub>2</sub>S<sub>2</sub> were sepd. from the wastewater by the headspace method and then detd. by gas chromatog. NH<sub>3</sub> and **Me<sub>3</sub>N** were sepd. from the wastewater by purging with N gas and detd. by absorptiometry and gas chromatog., resp. The max. concns. of **H<sub>2</sub>**, MeSH, Me<sub>2</sub>S<sub>2</sub>, NH<sub>3</sub>, and MeN in the samples were 0.0077,

0.050, 0.077, 38, and 0.17 mg/L, resp.

- IT **75-50-3, Trimethylamine**, uses and miscellaneous  
(in wastewater, from pulp mills and night soil treatment plants)  
RN 75-50-3 HCA  
CN Methanamine, N,N-dimethyl- (9CI) (CA INDEX NAME)



- CC 60-6 (Waste Treatment and Disposal)  
Section cross-reference(s): 43, 79  
ST hydrogen sulfide wastewater pulp night soil; methyl mercaptan  
wastewater pulp night soil; methyl disulfide wastewater pulp night  
soil; **trimethylamine** wastewater pulp mill night soil;  
ammonia wastewater pulp mill night soil; pulp mill night soil  
wastewater **odor**  
IT Wastewater  
(from night soil treatment plants, **odorous** substances  
in)  
IT Pulp, cellulose  
(wastewater from manuf. of, **odorous** substances in)  
IT Waste solids  
(night soil, effluent from treatment of, **odorous**  
substances in)  
IT 74-93-1, Methyl mercaptan, uses and miscellaneous **75-50-3**,  
**Trimethylamine**, uses and miscellaneous 624-92-0, Methyl  
disulfide 7664-41-7, Ammonia, uses and miscellaneous 7783-06-4,  
Hydrogen sulfide, uses and miscellaneous  
(in wastewater, from pulp mills and night soil treatment plants)  
IT 9004-34-6P  
(pulp, wastewater from manuf. of, **odorous** substances  
in)

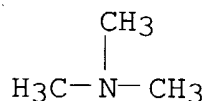
L54 ANSWER 21 OF 47 HCA COPYRIGHT 2004 ACS on STN

111:11968 Air deodorization using ozone. Kanzaki, Toshihide; Sano,  
Kunio; Nanba, Tasuku; Kobayashi, Motonobu; Inoue, Akira (Nippon  
Shokubai Kagaku Kogyo Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP  
63267362 A2 19881104 Showa, 5 pp. (Japanese). CODEN: JKXXAF.  
APPLICATION: JP 1987-99651 19870424.

- AB **Odorous** air contg. noxious components (e.g., H<sub>2</sub>S,  
mercaptans, and org. amines) is treated by contacting the air with a  
honeycomb catalyst (pore diam. 0.7-3 mm, cell thickness 0.2-0.5 mm,  
and porosity ≥50%) in the presence of O<sub>3</sub> at 0-300° and  
3000-30,000 h<sup>-1</sup> **gas** space velocity (GHSV) to  
decomp. the noxious components. Thus, an **odorous** air  
contg. 5 ppm **trimethylamine** was contacted with a honeycomb

catalyst (contg. TiO<sub>2</sub>/SiO<sub>2</sub>/MnO<sub>2</sub>, pore diam. 2.3 mm, cell thickness 0.42 mm, porosity 70%) in the presence of 20 ppm O<sub>3</sub> at 5° and 20,000 GHSV, resulting in the **trimethylamine** removal of 99%, vs. 78% for a conventional catalyst.

IT 75-50-3, **Trimethylamine**, uses and miscellaneous  
(removal of, from indoor air, by contacting with honeycomb three-way catalyst in presence of ozone)  
RN 75-50-3 HCA  
CN Methanamine, N,N-dimethyl- (9CI) (CA INDEX NAME)



IC ICM A61L009-015  
CC 59-6 (Air Pollution and Industrial Hygiene)  
IT 74-93-1, Methanethiol, uses and miscellaneous 75-50-3, **Trimethylamine**, uses and miscellaneous  
(removal of, from indoor air, by contacting with honeycomb three-way catalyst in presence of ozone)

L54 ANSWER 22 OF 47 HCA COPYRIGHT 2004 ACS on STN  
102:190256 Treatment of waste gas. (Fuji Kasui Kogyo Co., Ltd., Japan).  
Jpn. Kokai Tokkyo Koho JP 60007924 A2 19850116 Showa, 5 pp.  
(Japanese). CODEN: JKXXAF. APPLICATION: JP 1983-115272 19830628.

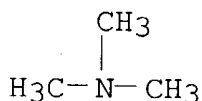
AB In deodorizing waste gas **contg.** reducing **S compds.**, the gas is contacted in the washing tower with circulating washing soln. contg. activated sludge before contacting with an aq. soln. contg. oxidizing agent. Gases contg. barely-sol. compds., e.g. reducing S-compd., are deodorized efficiently and at low cost. Thus, waste gas contg. H<sub>2</sub>S 2.5, MeSH [74-93-1] 0.43, and Me<sub>2</sub>S [75-18-3] 0.25 ppm from an edible oil manufg. plant was treated first with activated sludge (suspended solid 10,000 mg/L) and then with NaClO 500-1000 mg/L to give a treated gas contg. MeSH 0.09 ppm with H<sub>2</sub>S undetected and **odor** redn. by a factor of >52.

IT 7704-34-9D, compds.  
(removal of, from waste gases, by contacting with activated sludge and oxidizing agents)  
RN 7704-34-9 HCA  
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

IC ICM B01D053-34  
ICS B01D053-34

- CC 59-4 (Air Pollution and Industrial Hygiene)  
Section cross-reference(s): 61
- ST sulfur flue gas deodorizing; methylmercaptan gas deodorizing;  
dimethyl sulfide gas deodorizing; **hydrogen** sulfide  
**gas** deodorizing; sodium hypochlorite decompn sulfur gas;  
biol decompn sulfur gas; activated sludge decompn sulfur gas
- IT 74-93-1, uses and miscellaneous 75-18-3 7704-34-9D,  
compds. 7783-06-4, uses and miscellaneous  
(removal of, from waste gases, by contacting with activated  
sludge and oxidizing agents)
- L54 ANSWER 26 OF 47 HCA COPYRIGHT 2004 ACS on STN  
92:152161 Activated sludge deodorization of malodorous gases emitted  
from fish meal plant. Fukuyama, Joji; Honda, Atuhiko (Dep. Sanit.  
Eng., Osaka City Inst. Public Health Environ. Sci., Osaka, Japan).  
Seikatsu Eisei, 21(1), 30-6 (Japanese) 1977. CODEN: SEEIAY. ISSN:  
0582-4176.
- AB Activated sludge from a sewage treatment plant was cultured with  
**Me3N** (I) [75-50-3] solns. and used to study the  
sorption of the title **odorous** gases contg. I, NH3, and(or)  
Me2S [75-18-3]. At a loading rate of 1.2 mg I/g suspended solids-  
**h**, the treated **gas** was **odorless**,  
indicating that I and NH3 were decompd. completely; at 4.7 mg I/g  
suspended solids-h, the deodorization was good but the activated  
sludge soln. showed accumulation of NH3. The presence of Me2S  
retarded the decompn. of I, and the Me2S removal rate was low; a  
2-stage aeration treatment was required.
- IT 75-50-3, uses and miscellaneous  
(removal of, from malodorous waste gases at fish meal plant, by  
activated sludge)
- RN 75-50-3 HCA
- CN Methanamine, N,N-dimethyl- (9CI) (CA INDEX NAME)



- CC 59-2 (Air Pollution and Industrial Hygiene)  
Section cross-reference(s): 17, 60
- ST fish processing waste gas deodorization; activated sludge waste gas  
deodorization; ammonia removal gas activated sludge; methyl sulfide  
removal waste gas; **trimethylamine** removal gas activated  
sludge
- IT 75-18-3 75-50-3, uses and miscellaneous 7664-41-7, uses  
and miscellaneous  
(removal of, from malodorous waste gases at fish meal plant, by  
activated sludge)

L54 ANSWER 27 OF 47 HCA COPYRIGHT 2004 ACS on STN

92:134275 Concentration of **odorous** materials in environment.

Takaragi, Shunichi; Kumamoto, Takashi; Koreeda, Tetsuro; Koriyama, Tatsumi; Sakoda, Ryuhei (Kagoshima-ken Kogai Eisei Kenkyusho, Japan). Kagoshima-ken Kogai Eisei Kenkyushoho, Volume Date 1978, 14, 125-7 (Japanese) 1979. CODEN: KEKHDA. ISSN: 0388-2012.

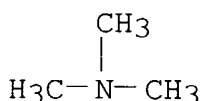
AB Air pollution by NH<sub>3</sub>, MeSH [74-93-1], H<sub>2</sub>S, Me<sub>2</sub>S [75-18-3], 902 Me<sub>2</sub>S<sub>2</sub>, Me<sub>3</sub>N [75-50-3], and styrene [100-42-5] was detd. in the air near various industrial plants (e.g., the poultry and the sewage treatment plants) in Kagoshima, Japan. All of the **odorous** contents in the air were within the environmental-air regulatory limits (Japan) except for the NH<sub>3</sub> near the poultry plant.

IT 75-50-3, preparation 1333-74-0, biological studies

(air pollution by, from industry, in Kagoshima, Japan)

RN 75-50-3 HCA

CN Methanamine, N,N-dimethyl- (9CI) (CA INDEX NAME)



RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

CC 59-2 (Air Pollution and Industrial Hygiene)

Section cross-reference(s): 17, 60

ST **odor** pollution industry Kagoshima Japan

IT 74-93-1, biological studies 75-18-3 75-50-3, preparation

100-42-5, biological studies 624-92-0 1333-74-0,

biological studies 7664-41-7, biological studies

(air pollution by, from industry, in Kagoshima, Japan)

L54 ANSWER 28 OF 47 HCA COPYRIGHT 2004 ACS on STN

91:9023 Deodorizing catalyst for ozone oxidation of drainage malodor.

Hayata, Terunobu; Okamoto, Masayoshi; Matsui, Shigeo (Tokyo Shibaura Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 54002288 19790109 Showa, 3 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1977-66738 19770608.

AB The deodorizing catalyst consists of activated C 10-50,  $\geq 1$  transition metal oxides 5-30, and inorg. gel 20-80 parts. The catalyst is useful in deodorization with O<sub>3</sub>. No ignition is obsd. Thus, activated C 100 mesh 40, Mn(NO<sub>3</sub>)<sub>2</sub> 20, and natural

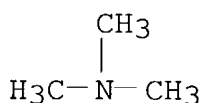


silica-alumina gel 40 parts were kneaded, pelletized to 4 diam. + 4 mm, and heated at 500° for 5 h in a H atm. Air contg. an **odorous** component 10 ppm and O3 was passed through the column contg. the catalyst. Mn(NO3)2 was converted to MnO during calcination. The removal was 95, 100, 100, 80, or 100% for H2S, MeSH, Me2S, NH3 or **Me3N**, as compared with 80, 95, 90, 50, or 100% without MnO, or with 95, 100, 80, 60, or 100% with activated C only.

IT 75-50-3, biological studies  
(removal of **odors** of, by activated carbon manganese oxide catalysts with ozone)

RN 75-50-3 HCA

CN Methanamine, N,N-dimethyl- (9CI) (CA INDEX NAME)



IC B01J023-34; B01D053-34; B01J037-00

CC 59-2 (Air Pollution and Industrial Hygiene)

IT Deodorization  
(of drainage **odors**, by activated carbon and manganese oxide catalyst with ozone)

IT 7440-44-0, biological studies  
(activated, deodorization by, and manganese oxide with ozone of drainage **odors**)

IT 1344-43-0, biological studies  
(deodorization by, and activated carbon with ozone of drainage **odors**)

IT 10028-15-6, biological studies  
(deodorization by, with activated carbon and manganese oxide catalysts of drainage **odors**)

IT 74-93-1, biological studies 75-18-3 **75-50-3**, biological studies 7664-41-7, biological studies 7783-06-4, biological studies  
(removal of **odors** of, by activated carbon manganese oxide catalysts with ozone)

L54 ANSWER 41 OF 47 HCA COPYRIGHT 2004 ACS on STN

31:61148 Original Reference No. 31:8432i,8433a-b Sensitive test for sulfur by means of nascent hydrogen. Schroer, Erich Mikrochemie, 22, 338-44 (Unavailable) 1937. CODEN: MIKRAJ. ISSN: 0369-0261.

AB If any **compd. contg. S** is placed in contact with Zn and HCl as in the Marsh test for As, H2S is formed and can be recognized by its effect upon the burning H2 flame. The only substances that interfere are Se and Te. A blue inner cone is noticed in the burning flame. If a cold piece of

porcelain is pressed down on the flame, a spot which lights up bluish is easily recognized in the dark. The test was obtained, e. g., with 0.2  $\gamma$  of  $H_2SO_4$ , 0.1  $\gamma$  of  $SO_2$ , 0.1  $\gamma$  of thiosulfate, a tiny grain of  $BaSO_4$ , 20  $\gamma$  of S, 40  $\gamma$  of  $CS_2$  and 0.17  $\gamma$  of thiophene. In some cases a little mercaptan is formed which is recognized by its repulsive odor. In testing gas mixts. it is often convenient to lead the gas through the Zn + HCl chamber into a soln. of  $Ca(OAc)_2$ ; the appearance of yellow CdS will show the presence of S. It is best to use a quartz capillary as burner so that no danger of color from the Na flame is encountered when the test is made.

CC 7 (Analytical Chemistry)

=> d his 155-

FILE 'HCA'

L55 920672 S (MIXT# OR MIXTURE? OR BLEND? OR ADMIX? OR COMMIX? OR IM  
 L56 17173 S (L2 OR L3) AND L55  
 L57 90 S L56 AND L13  
 L58 41 S L56 AND L14  
 L59 43 S L56 AND L15  
 L60 0 S L56 AND L16  
 L61 133 S L56 AND (L17 OR L25)  
 L62 43 S L56 AND (L18 OR L26)  
 L63 63 S L56 AND (L19 OR L24)  
 L64 0 S (L57-L63) AND L20  
 L65 3 S (L57-L63) AND L29  
 L66 13 S (L57-L63) AND (L47 OR L48 OR L49)  
 L67 15 S (L65 OR L66) NOT (L52 OR L53)

=> d 167 1-15 cbib abs hitstr hitind

L67 ANSWER 1 OF 15 HCA COPYRIGHT 2004 ACS on STN

139:324548 Curable foam elastomeric **compositions** and foam and means of gap filling and vibration damping. Lim, Thomas Fay-Oy; Lionberger, James E.; Nakos, Steven T. (Henkel Loctite Corporation, USA; Henkel Corporation). PCT Int. Appl. WO 2003087204 A1 20031023, 27 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY,

DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2003-US8802 20030324. PRIORITY: US 2002-PV370520 20020405.

- AB A 2-part curable foaming compn. comprises (A) component (i) an alkoxysilyl-capped prepolymer and (ii) a polyhydrogen siloxane (iii) optionally a catalyst which accelerates both foaming and crosslinking through the alkoxysilyl groups and (B) component (i) a **N-contg. compd.** having an active H, (ii) H<sub>2</sub>O, and (iii) optionally a catalyst which accelerates both foaming and crosslinking through the alkoxysilyl groups; provided that  $\geq 1$  of the parts contain a catalyst and where after mixing together A and B a cured elastomeric foam is formed. A foam resulted from mixing a compn. of trimethoxysilyl-capped polypropylene oxide 38.0, Niax L-1602 28.0, CaCO<sub>3</sub> 31.6, Me H siloxane 1.2, TINUVIN 765 0.4, TINUVIN 327 0.8 parts with Bu benzyl phthalate 25.0, CaCO<sub>3</sub> 72.2, C black 0.6, dibutylamine 0.6, water 0.6, and DBU 1.0 parts.
- IC ICM C08J009-02  
ICS C08J009-12; C08G077-00
- CC 39-9 (Synthetic Elastomers and Natural Rubber)
- IT Vibration dampers  
(**H gas**-liberating foaming elastomeric compns. of)
- IT Plastic foams  
(closed **cell**; **H gas**-liberating foaming elastomeric compns.)
- IT Polysiloxanes, uses  
(polyoxyalkylene-; **H gas**-liberating foaming elastomeric compns. of)
- IT Polyoxyalkylenes, uses  
(polysiloxane-; **H gas**-liberating foaming elastomeric compns. of)
- IT 100-76-5, Quinuclidine 111-92-2, Dibutylamine 280-57-9, 1,4-Diazabicyclo[2.2.2]octane 6674-22-2  
(**H gas**-liberating foaming elastomeric compns. of)
- IT 9004-73-3, Poly[oxy(methylsilylene)] 91630-31-8, Trimethoxysilylpropyl-terminated polypropylene glycol  
(**H gas**-liberating foaming elastomeric compns. of)

L67 ANSWER 2 OF 15 HCA COPYRIGHT 2004 ACS on STN

137:156832 **Compositions** and processes for synthesizing borohydride compounds. Amendola, Steven C.; Kelly, Michael T. (Millennium Cell, Inc., USA). U.S. US 6433129 B1 20020813, 15 pp. (English). CODEN: USXXAM. APPLICATION: US 2000-710041 20001108.

AB The present invention relates to compns. and processes for producing borohydride compds. In particular, the present invention provides

efficient processes and compns. for the large-scale prodn. of borohydride compds. The borohydride can be used directly as an anodic fuel in a **fuel cell** or as a **hydrogen storage** medium.

IT 1333-74-0, Hydrogen, reactions  
(compns. and processes for synthesizing borohydride compds.)  
RN 1333-74-0 HCA  
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

IT 7704-34-9D, Sulfur, alkyl derivs. 7782-44-7D,  
Oxygen, compds. 7782-49-2, Selenium, reactions  
7782-49-2D, Selenium, alkyl derivs.  
(compns. and processes for synthesizing borohydride compds.)  
RN 7704-34-9 HCA  
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

RN 7782-44-7 HCA  
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

RN 7782-49-2 HCA  
CN Selenium (8CI, 9CI) (CA INDEX NAME)

Se

RN 7782-49-2 HCA  
CN Selenium (8CI, 9CI) (CA INDEX NAME)

Se

IC ICM C08G070-08  
NCL 528271000  
CC 49-8 (Industrial Inorganic Chemicals)  
Section cross-reference(s): 52  
IT 1333-74-0, Hydrogen, reactions  
(compns. and processes for synthesizing borohydride compds.)  
IT 50-00-0, Formaldehyde, reactions 74-82-8, Methane, reactions  
75-07-0, Acetaldehyde, reactions 100-52-7, Benzaldehyde, reactions

124-38-9, Carbon dioxide, reactions 7439-93-2D, Lithium, compds.  
7440-08-6D, Polonium, compds. 7440-09-7D, Potassium, compds.  
7440-17-7D, Rubidium, compds. 7440-23-5D, Sodium, compds.  
7440-46-2D, Cesium, compds. 7440-68-8D, Astatine, compds.  
7440-73-5D, Francium, compds. 7553-56-2D, Iodine, compds.  
7704-34-9, Sulfur, reactions **7704-34-9D**, Sulfur, alkyl  
derivs. 7726-95-6D, Bromine, compds. 7732-18-5, Water, reactions  
7782-41-4D, Fluorine, compds. **7782-44-7D**, Oxygen, compds.  
**7782-49-2**, Selenium, reactions **7782-49-2D**,  
Selenium, alkyl derivs. 7782-50-5D, Chlorine, compds.  
10043-35-3, Boric acid (H<sub>3</sub>BO<sub>3</sub>), reactions 13494-80-9, Tellurium,  
reactions 13494-80-9D, Tellurium, alkyl derivs. 14798-03-9D,  
Ammonium, compds.  
(compns. and processes for synthesizing borohydride compds.)

L67 ANSWER 3 OF 15 HCA COPYRIGHT 2004 ACS on STN

136:250325 **Compositions** for use in batteries, capacitors,  
**fuel cells** and similar devices and for hydrogen  
production. Schmidt, David G. (USA). U.S. Pat. Appl. Publ. US  
2002037452 A1 20020328, 19 pp. (English). CODEN: USXXCO.  
APPLICATION: US 2001-887531 20010622. PRIORITY: US 2000-PV213395  
20000623.

AB This invention provides novel chem. compns., for use as electrode  
and electrolyte materials and for hydrogen prodn., methods for  
making these compns., and methods of using these compns. in a  
variety of applications. The new compns. of the present invention  
comprise: one or more transition metal compds.; aluminum; and either  
at least one sol. base or at least one sol. electrolyte in contact  
with the aluminum. The present invention may also comprise one or  
more elements and/or compds. having high mobility values for  
electrons, in some applications. This compn. is useful as novel  
electrode/electrolyte components in devices such as batteries,  
capacitors, **fuel cells** and similar devices, and  
also useful in the direct prodn. of **hydrogen gas**

IT **1333-74-0P**, Hydrogen, preparation  
(compns. for use in batteries, capacitors, **fuel**  
**cells** and similar devices and for hydrogen prodn.)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

IT **11138-42-4**, Mercury selenide **12069-00-0**, Lead  
selenide

(high electron mobility component; compns. for use in batteries,  
capacitors, **fuel cells** and similar devices

and for hydrogen prodn.)

RN 11138-42-4 HCA  
CN Mercury selenide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Se	x	7782-49-2
Hg	x	7439-97-6

RN 12069-00-0 HCA  
CN Lead selenide (PbSe) (8CI, 9CI) (CA INDEX NAME)

Pb—Se

IC ICM H01M004-46  
ICS H01M010-26; H01M004-58; H01M004-62; C01B003-08; C22C021-00;  
H01M008-08; H01M008-06; H01G009-035; H01G009-045; H01M004-36;  
H01M010-26

NCL 429218100

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 56, 76

ST battery electrode electrolyte component; capacitor electrode  
electrolyte component; **fuel cell** electrode  
electrolyte component; hydrogen prodn compn

IT Melting  
(arc; compns. for use in batteries, capacitors, **fuel  
cells** and similar devices and for hydrogen prodn.)

IT Battery anodes  
Battery electrolytes  
Capacitor electrodes  
Capacitors  
**Fuel cell** electrodes  
**Fuel cell** electrolytes  
Primary batteries  
(compns. for use in batteries, capacitors, **fuel  
cells** and similar devices and for hydrogen prodn.)

IT Transition metal compounds  
(compns. for use in batteries, capacitors, **fuel  
cells** and similar devices and for hydrogen prodn.)

IT 12054-48-7, Nickel hydroxide  
(compns. for use in batteries, capacitors, **fuel  
cells** and similar devices and for hydrogen prodn.)

IT 39396-58-2P  
(compns. for use in batteries, capacitors, **fuel  
cells** and similar devices and for hydrogen prodn.)

IT 404011-87-6P 404011-88-7P

- (compsns. for use in batteries, capacitors, **fuel cells** and similar devices and for hydrogen prodn.)
- IT 497-19-8, Sodium carbonate, uses 584-08-7, Potassium carbonate  
 1305-62-0, Calcium hydroxide, uses 1305-78-8, Calcia, uses  
 1309-42-8, Magnesium hydroxide 1310-58-3, Potassium hydroxide,  
 uses 1310-65-2, Lithium hydroxide 1310-73-2, Sodium hydroxide,  
 uses 1310-82-3, Rubidium hydroxide 7429-90-5, Aluminum, uses  
 7439-88-5D, Iridium, compd. 7439-89-6D, Iron, compd. 7440-02-0D,  
 Nickel, compd. 7440-04-2D, Osmium, compd. 7440-05-3D, Palladium,  
 compd. 7440-06-4D, Platinum, compd. 7440-16-6D, Rhodium, compd.  
 7440-18-8D, Ruthenium, compd. 7440-48-4D, Cobalt, compd.  
 7664-41-7, Ammonia, uses 17194-00-2, Barium hydroxide  
 18480-07-4, Strontium hydroxide 21351-79-1, Cesium hydroxide  
 (compsns. for use in batteries, capacitors, **fuel cells** and similar devices and for hydrogen prodn.)
- IT 1333-74-0P, Hydrogen, preparation  
 (compsns. for use in batteries, capacitors, **fuel cells** and similar devices and for hydrogen prodn.)
- IT 409-21-2, Silicon carbide sic, uses 1303-00-0, Gallium arsenide,  
 uses 1303-11-3, Indium arsenide, uses 1304-82-1, Bismuth  
 telluride bi2te3 1306-25-8, Cadmium telluride, uses 1312-41-0,  
 Indium antimonide 1314-91-6, Lead telluride 7440-21-3, Silicon,  
 uses 7440-31-5, Tin, uses 7440-44-0, Carbon, uses 7440-56-4,  
 Germanium, uses 7785-23-1, Silver bromide 11138-42-4,  
 Mercury selenide 12006-14-3, Cadmium tin arsenide cdsnas2  
 12014-06-1, Cadmium indium telluride cdin2te4 12014-17-4, Cadmium  
 silicon phosphide cdsip2 12037-74-0, Silicon zinc phosphide siznp2  
 12064-03-8, Gallium antimonide 12068-90-5, Mercury telluride  
 12069-00-0, Lead selenide 12362-59-3, Indium mercury  
 telluride in2hg5te8 13494-80-9, Tellurium, uses 22398-80-7,  
 Indium phosphide, uses 22831-42-1, Aluminum arsenide  
 (high electron mobility component; compsns. for use in batteries,  
 capacitors, **fuel cells** and similar devices  
 and for hydrogen prodn.)

L67 ANSWER 4 OF 15 HCA COPYRIGHT 2004 ACS on STN

136:72294 Novel alloy **compositions** for use as electrode  
 materials in batteries and for hydrogen production. Schmidt, David  
 G. (Millennium Energy, Llc, USA). PCT Int. Appl. WO 2002000950 A2  
 20020103, 58 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ,  
 BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE,  
 ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP,  
 KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,  
 NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ,  
 UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM;  
 RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA,  
 GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR.  
 (English). CODEN: PIXXD2. APPLICATION: WO 2001-US19996 20010621.

PRIORITY: US 2000-PV213945 20000623.

AB This invention provides new compns., methods for making these compns., and methods of using the compns. in a variety of energy-related applications. These compns. are useful as electrode materials in devices such as batteries, capacitors, **fuel cells** and similar devices as also in the direct prodn. of **hydrogen** and oxygen **gas**. The new compns. of the present invention comprise: (a) one or more of the transition metal elements; optionally (b) aluminum; optionally (c) one or more of the group 1A alkali metal elements; (d) one or more elements and/or compds. having high mobility values for electrons; and (e) a source of ionizing radiation. Thus, components a, d and e are required ingredients of the present invention, and components b and c are both optional. Components b and c may be used independently alone, together, or not at all.

IT 12069-00-0, Lead selenide 20601-83-6, Mercury selenide hgse

(alloy compns. for electrode materials in batteries and for hydrogen prodn.)

RN 12069-00-0 HCA

CN Lead selenide (PbSe) (8CI, 9CI) (CA INDEX NAME)

Pb=Se

RN 20601-83-6 HCA

CN Mercury selenide (HgSe) (6CI, 8CI, 9CI) (CA INDEX NAME)

Hg=Se

IT 1333-74-0P, Hydrogen, preparation

(alloy compns. for electrode materials in batteries and for hydrogen prodn.)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

IC ICM C22C

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 49, 56, 72, 76

ST battery electrode material alloy compn; hydrogen prodn electrode material alloy compn; **fuel cell** electrode material alloy compn; capacitor electrode material alloy compn

IT Battery electrodes

Capacitor electrodes



## Electron mobility

**Fuel cell electrodes**

(alloy compns. for electrode materials in batteries and for hydrogen prodn.)

- IT 409-21-2, Silicon carbide sic, uses 1303-00-0, Gallium arsenide, uses 1303-11-3, Indium arsenide, uses 1306-25-8, Cadmium telluride, uses 1312-41-0, Indium antimonide 1314-91-6, Lead telluride 7440-44-0, Carbon, uses 7785-23-1, Silver bromide 12006-14-3, Cadmium tin arsenide (CdSnAs<sub>2</sub>) 12014-06-1, Cadmium indium telluride (CdIn<sub>2</sub>Te<sub>4</sub>) 12014-17-4, Cadmium silicon phosphide (CdSiP<sub>2</sub>) 12037-74-0, Silicon zinc phosphide SiZnP<sub>2</sub> 12068-90-5, Mercury telluride hgte **12069-00-0**, Lead selenide 12362-59-3, Indium mercury telluride (In<sub>2</sub>Hg<sub>5</sub>Te<sub>8</sub>) **20601-83-6**, Mercury selenide hgse 22398-80-7, Indium phosphide, uses 22831-42-1, Aluminum arsenide
- (alloy compns. for electrode materials in batteries and for hydrogen prodn.)
- IT **1333-74-0P**, Hydrogen, preparation 7782-44-7P, Oxygen, preparation
- (alloy compns. for electrode materials in batteries and for hydrogen prodn.)

L67 ANSWER 5 OF 15 HCA COPYRIGHT 2004 ACS on STN

135:183053 Changes in the elemental **composition** of chalcopyrite based thin film solar cells after low energy hydrogen implantation. Otte, K.; Lippold, G.; Frost, F.; Frank, W.; Schindler, A.; Bigl, F. (Inst. Oberflächenmodifizierung, Leipzig, 04318, Germany). European Commission, [Report] EUR, EUR 18656, 2nd World Conference on Photovoltaic Solar Energy Conversion, 1998, Volume I, 656-659 (English) 1998. CODEN: CECED9. ISSN: 1018-5593.

- AB We studied the variation of the elemental compn. of polycryst. CuGaSe<sub>2</sub> absorber layers of thin film solar cells with a depth resoln. of 100 nm prior and after low energy hydrogen implantation. In order to obtain this depth resoln., the samples had to be flated by nitrogen ion beam etching under almost glancing incident angle yielding flat surfaces without inducing addnl. defects. On these flat surfaces beveling by nitrogen ions has been performed. TXRF- (Total-reflection X-Ray Fluorescence) and photoluminescence (PL)-measurements have been utilized to investigate the elemental compn. along the beveled section. For the Cu- and Ga-rich samples we obsd. a decrease of the Cu-concn. after the hydrogen implantation process in the hydrogen enriched near surface region. However, only for the Ga-rich sample a Cu-accumulation in deeper regions was obsd. These phenomena could be explained by a diffusion of mobile copper atoms from the hydrogenated near surface region, into a deeper region of the absorber layer due to the hydrogenation.

- IT **12018-83-6**, copper gallium selenide cugase2  
(changes in the elemental compn. of chalcopyrite based thin film

solar cells after low energy hydrogen implantation)

RN 12018-83-6 HCA

CN Copper gallium selenide (CuGaSe<sub>2</sub>) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
Se	2	7782-49-2
Ga	1	7440-55-3
Cu	1	7440-50-8

IT 1333-74-0, Hydrogen, uses

(implantation of; changes in the elemental compn. of chalcopyrite based thin film solar cells after low energy hydrogen implantation)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 76

ST chalcopyrite thin film solar **cell hydrogen**  
implantation; copper gallium selenide solar **cell**  
**hydrogen** implantation

IT 12018-83-6, copper gallium selenide cugase2

(changes in the elemental compn. of chalcopyrite based thin film solar cells after low energy hydrogen implantation)

IT 1333-74-0, Hydrogen, uses

(implantation of; changes in the elemental compn. of chalcopyrite based thin film solar cells after low energy hydrogen implantation)

L67 ANSWER 6 OF 15 HCA COPYRIGHT 2004 ACS on STN

135:155259 Alloy **compositions** for use as electrode materials  
and for hydrogen production. Schmidt, David G. (Millennium Energy,  
L.L.C., USA). PCT Int. Appl. WO 2001059858 A2 20010816, 50 pp.

DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR,  
BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD,  
GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,  
LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT,  
RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN,  
YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ,  
CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU,  
MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN:  
PIXXD2. APPLICATION: WO 2001-US40026 20010205. PRIORITY: US

2000-PV181263 20000209.

AB This invention provides novel metal alloys, methods for making these alloys, and methods of using these alloys in numerous applications. The alloys of the present invention comprise the following components: (A) one or more of the transition metal elements; at least one of either (B) aluminum or (C) one or more of the group 1A alkali metal elements; and (D) one or more elements and/or compds. having high mobility values for electrons. Thus, components A, D, and at least one of components B or C comprise the present invention. These alloys are useful as electrode materials in devices such as batteries, capacitors, **fuel cells**, and similar devices, and are also useful in the direct prodn. of **hydrogen gas**.

IT 11138-42-4, Mercury selenide 12069-00-0, Lead selenide

(alloy compns. for use as electrode materials and for hydrogen prodn.)

RN 11138-42-4 HCA

CN Mercury selenide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Se	x	7782-49-2
Hg	x	7439-97-6

RN 12069-00-0 HCA

CN Lead selenide (PbSe) (8CI, 9CI) (CA INDEX NAME)

Pb=Se

IT 1333-74-0P, Hydrogen, preparation

(alloy compns. for use as electrode materials and for hydrogen prodn.)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

IC ICM H01M004-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 56, 72, 76

ST alloy compn electrode material; battery alloy compn electrode material; capacitor alloy compn electrode material; **fuel cell** alloy compn electrode material; hydrogen prodn alloy compn electrode material

- IT Battery anodes  
Battery electrodes  
Capacitor electrodes  
Electrodes  
Electron mobility  
Fuel cell electrodes  
Fuel cells  
Sintering  
Vapor deposition process  
(alloy compns. for use as electrode materials and for hydrogen prodn.)
- IT 409-21-2, Silicon carbide sic, uses 1303-00-0, Gallium arsenide, uses 1303-11-3, Indium arsenide, uses 1304-82-1, Bismuth telluride  $\text{Bi}_2\text{Te}_3$  1306-25-8, Cadmium telluride, uses 1312-41-0, Indium antimonide 1314-91-6, Lead telluride 7440-21-3, Silicon, uses 7440-31-5, Tin, uses 7440-44-0, Carbon, uses 7440-56-4, Germanium, uses 7785-23-1, Silver bromide 11138-42-4, Mercury selenide 12006-14-3, Cadmium tin arsenide  $\text{CdSnAs}_2$  12014-06-1, Cadmium indium telluride  $\text{CdIn}_2\text{Te}_4$  12014-17-4, Cadmium silicon phosphide  $\text{CdSiP}_2$  12037-74-0, Silicon zinc phosphide  $\text{SiZnP}_2$  12064-03-8, Gallium antimonide 12068-90-5, Mercury telluride 12069-00-0, Lead selenide 12362-59-3, Indium mercury telluride  $\text{In}_2\text{Hg}_5\text{Te}_8$  13494-80-9, Tellurium, uses 22398-80-7, Indium phosphide, uses 22831-42-1, Aluminum arsenide  
(alloy compns. for use as electrode materials and for hydrogen prodn.)
- IT 1333-74-0P, Hydrogen, preparation  
(alloy compns. for use as electrode materials and for hydrogen prodn.)
- L67 ANSWER 7 OF 15 HCA COPYRIGHT 2004 ACS on STN
- 127:20155 Acoustic cell for determining **composition** of gas **mixtures**. Cadet, Gardy; Valdes, Jorge L. (Lucent Technologies Inc., USA). U.S. US 5625140 A 19970429, 12 pp. (English). CODEN: USXXAM. APPLICATION: US 1995-570906 19951212.
- AB The cell has transducers isolated from the cell body by a metal housing. A sound-absorbing sleeve around the body of the transducer increases the signal:noise ratio to  $\geq 4:1$ . Addnl., the transducers employed in the acoustic cell operate in the kHz range, reducing attenuation in the gas mixt. being analyzed. The cell body employs vacuum seals which permit the use of the cell in line with vacuum equipment.
- IT 1333-74-0, Hydrogen, analysis 7783-07-5, Hydrogen selenide  
(acoustic cell for detg. compn. of gas mixts. contg.)
- RN 1333-74-0 HCA
- CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

RN 7783-07-5 HCA

CN Hydrogen selenide (H<sub>2</sub>Se) (6CI, 8CI, 9CI) (CA INDEX NAME)H<sub>2</sub>Se

IC ICM G01N029-02

NCL 073024010

CC 47-8 (Apparatus and Plant Equipment)

Section cross-reference(s): 79

IT 74-82-8, Methane, analysis **1333-74-0, Hydrogen**,  
analysis 1445-79-0, Trimethyl gallium 3385-78-2, Trimethyl  
indium 7440-37-1, Argon, analysis 7440-59-7, Helium, analysis  
7664-41-7, Ammonia, analysis 7727-37-9, Nitrogen, analysis  
7782-44-7, Oxygen, analysis 7782-65-2, Germane **7783-07-5**  
, **Hydrogen** selenide 7784-42-1, Arsine 7803-62-5,  
Silicon hydride, analysis 10026-04-7, Silicon tetrachloride  
10038-98-9, Germanium tetrachloride  
(acoustic **cell** for detg. compn. of gas mixts. contg.)

L67 ANSWER 8 OF 15 HCA COPYRIGHT 2004 ACS on STN

125:225967 Gas-generating **mixture** for airbags. Redecker,  
Klaus; Weuter, Waldemar; Bley, Ulrich (Dynamit Nobel Ag, Germany).  
Ger. Offen. DE 19505568 A1 19960822, 10 pp. (German). CODEN:  
GWXXBX. APPLICATION: DE 1995-19505568 19950218.

AB A propellant for gas generators consists of (1) a **N-**  
**contg. compd.** from a group of tetrazole, triazole,  
triazine, HCN, urea, their derivs. or salts as a fuel, (2)  $\geq 3$   
comps. from a group of peroxides, nitrates, chlorates, or  
perchlorates as an oxidn. agent, (3) combustion moderators which  
affect combustion and combustion rate by heterogeneous or  
homogeneous catalysis, and optionally (4) additives decreasing the  
amt. of toxic gases. The mixts. do not generate toxic products  
during combustion in airbags.

IC ICM C06D005-06

ICA B60R021-26; C07D257-06; C07D257-04; C07D251-12; C07D249-14;  
C07D249-12; C07D251-54

CC 50-1 (Propellants and Explosives)

IT **Safety** devices

(airbags, gas generators for)

IT 51-79-6, Urethane 62-56-6, Thiourea, uses 67-52-7, Barbituric  
acid 79-17-4, Aminoguanidine 102-54-5, Ferrocene 108-19-0,  
Biuret 108-78-1, Melamine, uses 108-80-5, Cyanuric acid  
113-00-8, Guanidine 290-87-9, 1,3,5-Triazine 461-58-5,  
1-Cyanoguanidine 506-93-4, Guanidine nitrate 556-88-7,

Nitroguanidine 557-05-1, Zinc stearate 591-01-5,  
 Dicyanodiamidine sulfate 917-61-3, Sodium cyanate 932-64-9,  
 3-Nitro-1,2,4-triazol-5-one 1314-13-2, Zinc oxide, uses  
 1314-22-3, Zinc peroxide 1317-33-5, Molybdenum sulfide, uses  
 1934-75-4, Sodium dicyanamide 2165-23-3 2582-30-1,  
 Aminoguanidine **hydrogen** carbonate 2783-98-4,  
 5,5'-Bitetrazole 4000-16-2, Triaminoguanidine nitrate 4045-72-1,  
 3H-1,2,4-Triazol-3-one 4076-36-2, 5-Methyltetrazole 4418-61-5,  
 5-Aminotetrazole 5378-52-9 5422-45-7 5467-78-7,  
 1-Phenyl-5-aminotetrazole 6154-04-7, 2-Methyl-5-aminotetrazole  
 6280-33-7 6484-52-2, Ammonium nitrate, uses 7439-89-6, Iron,  
 uses 7439-98-7, Molybdenum, uses 7440-05-3, Palladium, uses  
 7440-06-4, Platinum, uses 7440-15-5, Rhenium, uses 7440-16-6,  
 Rhodium, uses 7440-18-8, Ruthenium, uses 7440-21-3, Silicon,  
 uses 7440-32-6, Titanium, uses 7440-42-8, Boron, uses  
 7440-50-8, Copper, uses 7440-66-6, Zinc, uses 7631-99-4, Sodium  
 nitrate, uses 7704-34-9, Sulfur, uses 7757-79-1, Potassium  
 nitrate, uses 7778-74-7, Potassium perchlorate 7782-42-5,  
 Graphite, uses 7790-69-4, Lithium nitrate 7790-98-9, Ammonium  
 perchlorate 9002-84-0, Teflon 10042-76-9, Strontium nitrate  
 10043-11-5, Boron nitride (BN), uses 10308-82-4, Aminoguanidine  
 nitrate 13175-00-3 14807-96-6, Talc, uses 14832-59-8  
 15454-56-5 16421-52-6, 5-Hydroxytetrazole 16681-77-9,  
 1-Methyltetrazole 16681-78-0, 2-Methyltetrazole 16687-60-8  
 17267-51-5, 1-Methyl-5-methylaminotetrazole 18039-42-4,  
 5-Phenyltetrazole 24994-04-5, 5-(p-Tolyl)-tetrazole 31330-63-9,  
 Tetrazene 31602-64-9, 1H-Tetrazole-5-ethanamine 43146-62-9,  
 5-Aminotetrazole nitrate 46047-18-1 50917-68-5, Semicarbazide  
 nitrate 53010-03-0 55513-24-1 56476-95-0, 2-Phenyltetrazole  
 88511-19-7 95112-14-4, 2-Ethyl-5-aminotetrazole 136369-04-5  
 142353-07-9 145315-16-8 170695-08-6 181648-89-5 181648-90-8  
 181648-91-9 181648-94-2 181648-97-5 181648-98-6 181648-99-7  
 181649-00-3 181649-01-4

(in **gas** generator for automobile airbags)

L67 ANSWER 9 OF 15 HCA COPYRIGHT 2004 ACS on STN

122:318553 The influence of catalyst type on the **composition**  
 of upgraded biomass pyrolysis oils. Williams, Paul T.; Horne,  
 Patrick A. (Department of Fuel and Energy, The University of Leeds,  
 Leeds, LS2 9JT, UK). Journal of Analytical and Applied Pyrolysis,  
 31, 39-61 (English) 1995. CODEN: JAAPDD. ISSN: 0165-2370.  
 Publisher: Elsevier.

AB The compn. of oils derived from the online, low pressure upgrading  
 of biomass pyrolysis oils from a fluidized bed pyrolysis unit have  
 been investigated in relation to catalyst type. Na-ZSM-5 (partially  
 exchanged), H-ZSM-5 and Y type zeolite catalysts, and activated  
 alumina were used. In addn., a blank run was undertaken in which  
 the catalyst bed was replaced by a bed of stainless steel

ball-bearings to det. the influence of thermal cracking. The compn. of the oils before catalysis and after catalyst upgrading were analyzed by liq. chromatog. fractionation, followed by coupled gas chromatog./mass spectrometry anal. of each fraction. In particular, the arom. and oxygenated arom. species were identified and quantified. There were only small differences in the product yields and compns. from the catalysis of biomass derived pyrolysis oils for the Na-ZSM-5 and H-ZSM-5 catalysts. All of the catalysts were effective in deoxygenating the biomass pyrolysis oils; however, there were still significant concns. of **oxygenated compds.** in the upgraded oils. The ZSM-5 catalysts gave the highest yields of hydrocarbon products when compared to the Y-zeolite and activated alumina catalysts. Significant concns. of polycyclic arom. hydrocarbons (PAH) were formed by all the catalysts. Some of the PAH have been shown to be carcinogenic in biol. studies. The formation of coke was increased for Y-zeolite and alumina compared to the Na-ZSM-5 and H-ZSM-5 catalysts.

IT 1333-74-0P, Hydrogen, preparation  
(influence of catalyst type on the compn. of upgraded biomass pyrolysis oils)  
RN 1333-74-0 HCA  
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 67

IT Catalysts and Catalysis  
Fuel gas manufacturing  
(influence of catalyst type on the compn. of upgraded biomass pyrolysis oils)

IT 74-82-8P, Methane, preparation 74-84-0P, Ethane, preparation  
74-85-1P, Ethylene, preparation 74-98-6P, Propane, preparation  
115-07-1P, Propylene, preparation 124-38-9P, Carbon dioxide, preparation  
630-08-0P, Carbon monoxide, preparation  
1333-74-0P, Hydrogen, preparation  
(influence of catalyst type on the compn. of upgraded biomass pyrolysis oils)

L67 ANSWER 10 OF 15 HCA COPYRIGHT 2004 ACS on STN

103:56151 Desulfurization of a hydrogen-nitrogen **mixture** by a concentrate of Chiatura porous manganese ore. Chochishvili, N. M. (Inst. Neorg. Khim. Elektrokhim., Tbilisi, USSR). Soobshcheniya Akademii Nauk Gruzinskoi SSR, 117(2), 325-8 (Russian) 1985. CODEN: SAKNAH. ISSN: 0002-3167.

AB The effect of the temp. (200-400°) and time (250-430 min) on the removal of H<sub>2</sub>S from a gas mixt. of H<sub>2</sub> and N<sub>2</sub> (

H<sub>2</sub>:N<sub>2</sub> ratio 3:1) by absorption on a porous Mn ore was studied. The H<sub>2</sub>S removal was max. 99.7% at 250° and 325 min. contact time. The reaction was catalytic and absorption controlled at <300 and >300°, resp. The S was retained by the ore as MnS which can be oxidized at 840-1000°. The results can be used also for **fuel gas** purifn. by using Mn ore.

IT 7704-34-9D, compds.  
(removal of, from hydrogen - nitrogen mixt., by manganese ores)  
RN 7704-34-9 HCA  
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

IT 1333-74-0, uses and miscellaneous  
(sulfur compds. removal from nitrogen and, by manganese ores)  
RN 1333-74-0 HCA  
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

CC 49-9 (Industrial Inorganic Chemicals)  
ST **hydrogen** sulfide removal **fuel gas**;  
manganese ore **fuel gas** sulfide  
IT **Fuel gases**  
(purifn. of, by sulfur compds. removal with manganese ores)  
IT Manganese ores  
(removal by, of sulfur compds., from **fuel gases**  
and **hydrogen**-nitrogen mixts.)  
IT 7704-34-9D, compds.  
(removal of, from hydrogen - nitrogen mixt., by manganese ores)  
IT 7783-06-4, uses and miscellaneous  
(removal of, from hydrogen-nitrogen mixt. and **fuel**  
**gases**, by manganese ores)  
IT 1333-74-0, uses and miscellaneous  
(sulfur compds. removal from nitrogen and, by manganese ores)

L67 ANSWER 11 OF 15 HCA COPYRIGHT 2004 ACS on STN

102:165481 Comparison of **compositions** of **odor**  
components of natto and cooked soybeans. Sugawara, Etsuko; Ito,  
Tetsuo; Odagiri, Satoshi; Kubota, Kikue; Kobayashi, Akio (Iwate  
Prefect. Morioka Junior Coll., Morioka, 020, Japan). Agricultural  
and Biological Chemistry, 49(2), 311-17 (English) 1985. CODEN:  
ABCHA6. ISSN: 0002-1369.

AB Natto, a traditional Japanese food product, was prepd. from cooked  
soybeans by fermn. with Bacillus natto, and its **odor** conc.  
was obtained with a simultaneous distn. and extn. system. It was



compared with those obtained from soybeans cooked for 0-3, 3-5.5, and 5.5-8 h, resp., by **gas** chromatog. and gas chromatog.-mass spectrometry. In the **odor** concs. of the cooked soybeans, hexanal [66-25-1], (E)-2-hexenal [6728-26-3] and hexanol [111-27-3], which contribute to the green and grassy color of soybeans, disappeared or decreased during cooking. 2-Pentylfuran [3777-69-3] and 1-octen-3-ol [3391-86-4], which contribute to the beany **odor**, remained even after the soybeans were cooked for 8 h and were fermented into natto. Pyrazines and **S-contg. compds.** were important contributors to the characteristic **odor** of natto. Apparently, pyrazines and **S-contg. compds.** cause the characteristic **odor** of natto and mask the beany **odor**.

CC 17-10 (Food and Feed Chemistry)

ST natto soybean food **odor** compd; cooking soybean **odor** compd

IT Soybean

(**odor** compds. of cooked and fermented natto)

IT Volatile substances

(of cooked soybean and fermented natto soybean product, **odor** in relation to)

IT **Odor** and **Odorous** substances

(of cooked soybeans and fermented natto soybean product)

IT 32272-48-3 38348-23-1 38348-24-2

(of cooked soybean and fermented natto soybean product **odor**)

IT 66-25-1 98-00-0 111-27-3, biological studies 123-51-3

3391-86-4 3777-69-3 6728-26-3 53477-30-8

(of cooked soybean **odor**)

IT 109-08-0 123-32-0 638-17-5 1124-11-4 5910-89-4 13360-65-1

13925-03-6 13925-07-0 14667-55-1 17398-16-2

(of fermented natto soybean product **odor**)

L67 ANSWER 12 OF 15 HCA COPYRIGHT 2004 ACS on STN

94:87036 Hydrogen sulfide removal from gas **mixtures**.

Lozinski, Tadeusz; Warkowski, Ignacy; Steinmetz, Zygmunt; Steinmetz, Grazyna; Rappe, Jerzy (Huta im. Lenina, Pol.). Pol. PL 102959 19790531, 2 pp. (Polish). CODEN: POXXA7. APPLICATION: PL 1976-188362 19760329.

AB To remove H<sub>2</sub>S from gas mixts. and recover S, the gases are washed with an absorption aq. soln. **contg.** O- and

**S-contg.** As<sub>5</sub><sup>+</sup> **compds.** which are

continuously activated by O-**contg.** As<sub>3</sub><sup>+</sup>

**compds.**, hydroquinone (I) [123-31-9], and Na<sub>2</sub>CO<sub>3</sub>. The

contents of As<sub>2</sub>O<sub>3</sub> and I are 9-11 and ≤0.005 g/L, resp.

Regeneration of the soln. is done in ≥2 stages by blowing air

or O. Thus, coke-oven gas **contg.** 7-9 g H<sub>2</sub>S/m<sup>3</sup> was washed at

45° with an absorption soln. contg. 0.003 g I and O - and **S-contg.** As<sup>5+</sup> **compds.** prepd. by dissoln. of 10 g As<sub>2</sub>O<sub>3</sub>/L in a Na<sub>2</sub>CO<sub>3</sub> soln. and following with sulfurization. The soln. pH was 7.7-8.0. The absorption soln. was continuously activated by adding an aq. soln. contg. Na<sub>2</sub>CO<sub>3</sub> 250, As<sub>2</sub>O<sub>3</sub> 40, and I 1 g/L. After purifn., the coke-oven gas contained only 0.1 g H<sub>2</sub>S/m<sup>3</sup>. Content of the residual H<sub>2</sub>S was lower by a factor of 10 than that obtained in the conventional process. The absorption soln. was charged into a regeneration column. Air 150 m<sup>3</sup>/h was blown into a bottom part of the column. Pptd. S was removed in the top part of the column by flotation with 850 m<sup>3</sup> air/h.

IC C10K001-08

CC 51-27 (Fossil Fuels, Derivatives, and Related Products)

ST **hydrogen** sulfide removal **fuel gas**

IT **Fuel gases**

(**hydrogen** sulfide removal from, arsenic oxide-sodium carbonate-hydroquinone in)

IT 123-31-9, uses and miscellaneous 497-19-8, uses and miscellaneous 1327-53-3

(in **hydrogen** sulfide removal, from **fuel gas**)

IT 7783-06-4, uses and miscellaneous

(removal of, from **fuel gas**, arsenic oxide-sodium carbonate-hydroquinone in)

L67 ANSWER 13 OF 15 HCA COPYRIGHT 2004 ACS on STN

63:75898 Original Reference No. 63:14004g-h Differences in the **composition** of the alcohol obtained from molasses in comparison with one obtained from grains and potatoes. Polozhentseva, N. G.; Gryaznov, V. P. Fermentnaya i Spirit. Prom., 31(5), 9-12 (Russian) 1965.

AB The impurities in EtOH of various origins, also in its purified fractions, and in the spent wash, were analyzed by gas chromatography with triethylene glycol as a stationary phase with addn. of stearic acid at a column temp. of 68°; the carrier **gas** (H) was passed through at 1 l./hr. The essential differences are that EtOH obtained by fermentation of molasses contained more Ac<sub>2</sub> and more N compds., like **Me<sub>3</sub>N**, Et<sub>3</sub>N, and EtNH<sub>2</sub>, which account for its different **organoleptic** properties.

CC 74 (Fermentations)

L67 ANSWER 14 OF 15 HCA COPYRIGHT 2004 ACS on STN

47:33463 Original Reference No. 47:5667e Removing hydrogen sulfide from a gas **mixture** with a purification material and then revivifying that material. Phillips, Ian H. (Humphreys & Glasgow Ltd.). GB 681551 19521029 (Unavailable). APPLICATION: GB .

AB H<sub>2</sub>S as in coke-oven gas is removed with a material contg. Fe(OH)<sub>3</sub>.

This material is revivified by passing air or other O-  
**contg.** gas through the **material**.

CC 21 (Fuels and Carbonization Products)

IT **Fuel gas**

(**hydrogen** sulfide removal from, and regeneration of  
Fe(OH)3 from)

L67 ANSWER 15 OF 15 HCA COPYRIGHT 2004 ACS on STN

27:19165 Original Reference No. 27:1740d-e Recovering sulfur and  
ammonium compounds from **gas mixtures** containing  
**hydrogen** sulfide. Hansen, Christian J. (Koppers Co. of  
Del.). US 1889894 19321206 (Unavailable). APPLICATION: US .

AB A gas mixt. contg. H2S and NH3 such as coke-oven gas is treated in  
not less than 3 consecutive steps with a washing liquid contg. a  
thionate of a metal such as Fe, Mn or Zn forming sulfides insol. in  
water but sol. in the presence of SO2, and there is provided in a  
medium washing step only for that quantity of NH3 which is required  
in the conversion of the dissolved metal compds. into sulfides, and  
the spent washing liquor is withdrawn from this medium step.

CC 21 (Fuels, Gas, Tar, and Coke)

IT **Gas**, illuminating and **fuel**  
(sulfur recovery from)

IT 7783-06-4, **Hydrogen** sulfide  
(**gas contg.**, recovering **S** and NH4  
compds. from)

=> d his 168-

FILE 'HCA'

L68 10828 S (HYDROGEN# OR H2 OR H)/TI AND L55  
L69 36 S L68 AND L13  
L70 12 S L68 AND L14  
L71 22 S L68 AND L15  
L72 0 S L68 AND L16  
L73 61 S L68 AND (L17 OR L25)  
L74 17 S L68 AND (L18 OR L26)  
L75 63 S L63 AND (L19 OR L24)  
L76 14 S (L69-L75) AND (L20 OR L29 OR L47 OR L48 OR L49)  
L77 4 S L76 NOT (L52 OR L53 OR L67)  
L78 180 S (L69-L75) NOT (L52 OR L53 OR L54 OR L67 OR L77)  
L79 1107 S (HYDROGEN# OR H2 OR H)/TI(A)L55  
L80 14 S L78 AND L79

=> d 177 1-4 cbib abs hitstr hitind

L77 ANSWER 1 OF 4 HCA COPYRIGHT 2004 ACS on STN

116:172614 Essential oil of nutmeg (*Myristica fragrans*

H.): Isolation and chemical **composition**. Pino, J. A.; Borges, P.; Mollinedo, B. (Inst. Invest. Ind. Aliment., Havana, Cuba). Revista de Agroquimica y Tecnologia de Alimentos, 31(3), 411-16 (Spanish) 1991. CODEN: RATLAB. ISSN: 0034-7698.

AB In pilot-scale expts., nutmeg oil yields of 96% were obtained by steam distn. at a pressure of 400 kPa and a flow rate of 30 L/h. Max. yields were obtained within 8 h. Gas chromatog. of the steam-distd. oil indicated a terpene content of 86.8% (13.2% **oxygenated compds.**). **Organoleptic** properties were satisfactory.

CC 17-6 (Food and Feed Chemistry)

Section cross-reference(s): 62

L77 ANSWER 2 OF 4 HCA COPYRIGHT 2004 ACS on STN

113:233778 Bleaching aid **compositions** used simultaneously with **hydrogen** peroxide and/or its adducts in laundry detergents.

Nakamura, Kazuto; Nomura, Koki (Lion Corp., Japan). Jpn. Kokai Tokkyo Koho JP 02173098 A2 19900704 Heisei, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1988-328757 19881226.

AB The fast-acting title compns. with improved dissoln. rate contain (A) bleach activator selected from **N-heterocyclic compd. contg.** halogen substituted on the secondary amino group on the ring and nonheterocyclic N-halo hindered amine, with equil. const. in hydrolysis with hypohalo acid formation  $1 + 10^{-10}$  to  $5 + 10^{-6}$  ( $>5^\circ$ ), and (B) the above amine precursor (before halogenation) at A/B ratio 30-97:70-1. A 99:1 mixt. of 1-chloro-4-hydroxy-2,2,6,6-tetramethylpiperidine (I) and 4-hydroxy-2,2,6,6-tetramethylpiperidine (II) showed dissoln. rate 1000 s, compared with  $>20,000$  s for I alone. A compn. from Na percarbonate 85, polyoxyethylene dodecyl ether-contg. detergent powder 5, Alcalase 2.05 l,  $\text{CaCO}_3$  0.5H<sub>2</sub>O 2, blue pigment 1.5, **perfume** 1.5, and  $\text{Na}_2\text{CO}_3$  to 100% was mixed 80:20 with 70:20:10 I-II-K<sub>2</sub>SO<sub>4</sub> granules to give a detergent with bleaching power 68, compared with 42 for a control not contg. the granules.

IC ICM C11D007-54

ICS C11D003-395; D06L003-08; D21C009-16

CC 46-5 (Surface Active Agents and Detergents)

L77 ANSWER 3 OF 4 HCA COPYRIGHT 2004 ACS on STN

93:206528 **Hydrogen** peroxide bleach **composition**.

Kandathil, Thomas V. (Johnson, S. C., and Son, Inc., USA). Eur. Pat. Appl. EP 13886 19800806, 24 pp. (English). CODEN: EPXXDW. APPLICATION: EP 1980-100046 19800104.

AB Stable aq. H<sub>2</sub>O<sub>2</sub> bleach compns. suitable for household use are prepd. The compns. contain 2-12% H<sub>2</sub>O<sub>2</sub>, small amts. of a **N-**

**contg. compd.** such as DL-methionine [59-51-8], glycine [56-40-6],  $N(CH_2CH_2OH)_3$  [102-71-6], or iso-PrNH<sub>2</sub> [75-31-0], small amts. of normally unstable dyes and were fluorescent whiteners, and sufficient acid (org., boric, and/or phosphoric) to give pH 1.8-5.5. Thus, a bleaching compn. contained 28% aq. NH<sub>4</sub>OH 1.2138, DL-methionine 0.1, phthalic acid 1.6613, 35% H<sub>2</sub>O<sub>2</sub> (Albone 35 CG) 17.14, ethoxylated (9.5 mols.) nonylphenol 3, **perfume** 0.15, C. I. Acid Blue 127-1 [12237-86-4] 0.0018, C. I. Direct Violet 9 [6227-14-1] 0.000165, C. I. Fluorescent Brightener 35 [27344-41-8] 0.1, C. I. Fluorescent Brightener 140 [61968-71-6] 0.05, and water .apprx.76%. After 24 h at 100°, the dyes and **perfumes** in the compn. were not degraded and the loss of H<sub>2</sub>O<sub>2</sub> was <5%.

IC C11D003-39; C11D003-395; C11D003-40; D06L003-02  
CC 46-6 (Surface Active Agents and Detergents)

L77 ANSWER 4 OF 4 HCA COPYRIGHT 2004 ACS on STN

82:115591 Preparation of **mixtures** of humidified air with carbon monoxide, sulfur dioxide, nitrogen dioxide, ammonia, **methylamine**, chlorine, and **hydrogen** chloride to measure respirator cartridge and canister service life. Nelson, Gary O.; Swisher, Leonard E.; Taylor, Robert D.; Bigler, Bruce E. (Lawrence Livermore Lab., Univ. California, Livermore, CA, USA). American Industrial Hygiene Association Journal (1958-1999), 36(1), 49-56 (English) 1975. CODEN: AIHAAP. ISSN: 0002-8894.

AB Four systems were devised to produce known concns. of CO, SO<sub>2</sub>-NO<sub>2</sub>, NH<sub>3</sub>-MeNH<sub>2</sub>, Cl-HCl as contaminants in humidified air for assessment of service life of respirator cartridges and canisters.

IT **74-89-5**  
(polluted air mixt. contg., for service life detn. of respirators)

RN 74-89-5 HCA

CN Methanamine (9CI) (CA INDEX NAME)

H<sub>3</sub>C-NH<sub>2</sub>

CC 59-3 (Air Pollution and Industrial Hygiene)

ST canister service life; **safety** canister service life; respirator cartridge service life; carbon monoxide canister service life; sulfur dioxide canister service life; nitrogen dioxide canister service life; ammonia canister service life; **methylamine** canister service life; chlorine canister service life; hydrogen chloride canister service life

IT **74-89-5** 630-08-0, uses and miscellaneous 7446-09-5, uses and miscellaneous 7647-01-0, uses and miscellaneous 7664-41-7, uses and miscellaneous 7782-50-5, uses and miscellaneous 10102-44-0, uses and miscellaneous

(polluted air mixt. contg., for service life detn. of respirators)

=> d 180 1-14 ti

L80 ANSWER 1 OF 14 HCA COPYRIGHT 2004 ACS on STN

TI interEffect of Ar/H<sub>2</sub> and Kr/H<sub>2</sub> **mixtures** as discharge gas on the ion intensity in d.c. glow discharge mass spectrometry

L80 ANSWER 2 OF 14 HCA COPYRIGHT 2004 ACS on STN

TI Relative ion yields measured with a high-resolution glow discharge mass spectrometer operated with an argon/**hydrogen mixture**

L80 ANSWER 3 OF 14 HCA COPYRIGHT 2004 ACS on STN

TI Filter for cleaning nitrogen/**hydrogen mixture**

L80 ANSWER 4 OF 14 HCA COPYRIGHT 2004 ACS on STN

TI Effects of argon partial pressure and **hydrogen admixtures** on the properties of sputtered cadmium indium selenide (CuInSe<sub>2</sub>) thin films

L80 ANSWER 5 OF 14 HCA COPYRIGHT 2004 ACS on STN

TI Radiation-induced chemical reactions of carbon monoxide and **hydrogen mixture**. II. Effects of reactant pressure and temperature on the yields of oxygen containing products

L80 ANSWER 6 OF 14 HCA COPYRIGHT 2004 ACS on STN

TI Radiation-induced chemical reactions of carbon monoxide and **hydrogen mixture** - I. Electron beam irradiation at atmospheric pressure

L80 ANSWER 7 OF 14 HCA COPYRIGHT 2004 ACS on STN

TI Preliminary investigations of oxygen-18/oxygen-16 and deuterium/**hydrogen compositions** in rhyo-ignimbrites in the In Hihaou (In Zize) Magmatic Center, central Ahaggar, Algeria

L80 ANSWER 8 OF 14 HCA COPYRIGHT 2004 ACS on STN

TI The  $\gamma$ -ray-induced reactions of carbon monoxide-**hydrogen mixtures** at elevated pressures

L80 ANSWER 9 OF 14 HCA COPYRIGHT 2004 ACS on STN

TI Formation of subsurface waters in the Caucasus from data on the study of the isotopic oxygen and **hydrogen compositions**

- L80 ANSWER 10 OF 14 HCA COPYRIGHT 2004 ACS on STN  
TI Catalytic hydrogenation of **oxygen-containing compounds** with a **nitrogen-hydrogen mixture** at 250 atmospheres
- L80 ANSWER 11 OF 14 HCA COPYRIGHT 2004 ACS on STN  
TI Reaction of methanol with carbon monoxide at high pressure in the presence of metal carbonyl catalyst. IV. The synthesis of **oxygenated organic compounds** from methanol and carbon monoxide-**hydrogen mixtures** in the presence of cobalt acetate and an iodide used as the catalyst
- L80 ANSWER 12 OF 14 HCA COPYRIGHT 2004 ACS on STN  
TI Synthesis of **oxygenated organic compounds** from methanol and carbon monoxide-**hydrogen mixtures** in the presence of a **mixture** of cobalt acetate and an iodide used as the catalyst
- L80 ANSWER 13 OF 14 HCA COPYRIGHT 2004 ACS on STN  
TI Catalytic conversion of carbon monoxide-**hydrogen mixtures** into hydrocarbons or **oxygen-containing organic compounds**
- L80 ANSWER 14 OF 14 HCA COPYRIGHT 2004 ACS on STN  
TI Sulfur removal from carbon monoxide-**hydrogen mixtures**

=> d 180 10,12,13,14 cbib abs hitstr hitind

- L80 ANSWER 10 OF 14 HCA COPYRIGHT 2004 ACS on STN  
64:67246 Original Reference No. 64:12535e-g Catalytic hydrogenation of **oxygen-containing compounds** with a **nitrogen-hydrogen mixture** at 250 atmospheres.  
Loktev, A. M. (Integrated Chem. Works, Novomoskovsk).  
Neftepererabotka i Neftekhim., Nauchn.-Tekhn. Sb. (11), 21-4 (Russian) 1965.
- AB The title process studied previously (CA 60, 6735e) on a lab. scale was transferred into a pilot plant. In addn. to the catalysts reported, the Cu-diatomaceous earth catalyst was tested using the Box-Wilson method for programming the expts. For the pilot plant examn. the most promising Cu-Cr catalyst was selected. To eliminate the diffusion complications encountered in the hydrogenation of the ester components of the feed, the pilot plant reactor was designed to secure in comparison with its lab. counterpart a higher linear rate at the same space rate; it consisted essentially of a 124-mm. internal diam. stainless steel cylinder charged with 17-20 l. of the catalyst. The pressure of 250 atm. in the app. was controlled by a

regulator described earlier (Loktev, et al., CA 51, 15181b). The liquid raw material was centrifuged to sep. solid high-boiling admixts. prior to entering the system. The results obtained were similar to those achieved in the lab. scale expts.

CC 33 (Aliphatic Compounds)

L80 ANSWER 12 OF 14 HCA COPYRIGHT 2004 ACS on STN

60:60420 Original Reference No. 60:10541a-c Synthesis of

**oxygenated organic compounds** from methanol and carbon monoxide-hydrogen mixtures in the presence of a **mixture** of cobalt acetate and an iodide used as the catalyst. Mizoroki, Tsutomu; Nakayama, Mikitake (Govt. Chem. Ind. Res. Inst., Tokyo). Bulletin of the Chemical Society of Japan, 37(2), 237-41 (Unavailable) 1964. CODEN: BCSJA8. ISSN: 0009-2673.

AB The reaction of MeOH with CO-H mixts. was carried out in the presence of a mixt. of Co(OAc)<sub>2</sub> and an iodide as catalyst. The extent of MeOH conversion into C2-**oxygenated compds.**, AcH, EtOH, and acetic acid esters was 40-60% when the catalyst concn. range was from 1-20 mole-%, the temp. range 180-220°, the pressure range 300-500 kg./cm.<sup>2</sup> (the H-CO values in synthesis gases were 1 to 1.5), and the reaction time 90 min. The amt. of free HOAc, C3- and higher **oxygenated compds.** in the liquid product was small. The use of iodine instead of an iodide was disadvantageous. From the detailed investigation of the influence of the extent of conversion of MeOH into C2-**oxygenated compds.**, it was shown that the formation of AcH was favored in the presence of a relatively large amt. of an iodide and that an increase in Co(OAc)<sub>2</sub> resulted in an increase in the yield of EtOH. It was postulated that, under these conditions, MeOH reacted with CO and H to form AcH which subsequently was hydrogenated to EtOH or dimerized to other **oxygenated compds.**

CC 33 (Aliphatic Compounds)

L80 ANSWER 13 OF 14 HCA COPYRIGHT 2004 ACS on STN

52:107987 Original Reference No. 52:19093g-i,19094a Catalytic

conversion of carbon monoxide-hydrogen mixtures into hydrocarbons or **oxygen-containing organic compounds**. Herbert, Wilhelm (Metallgesellschaft A.-G.). DE 936265 19551207 (Unavailable). APPLICATION: DE .

AB The conversion of water gas to hydrocarbons and O compds. is carried out under pressure in a 2-step process. In the 1st step, the gas mixt. is treated with a Fe catalyst and recycled to give paraffins, conversion being 75-80%. In the 2nd step, a Co catalyst is used with only small losses of Co. By recycling, the Fe catalyst lasts longer and most of the reaction heat is freed in the 1st step. The catalysts can be activated with metals, oxides, hydroxides, etc. The effluent gas from the first step contains more H than necessary



and addnl. water gas can be added in order to obtain the optimum compn. for the 2nd step. The hydrocarbons formed need not be removed between the 2 steps of the process. Thus, 1000 l. of a granular catalyst contg. Fe and Fe oxides 100, Cu 5, Al(OH)<sub>3</sub> 9, K silicate 5, and diatomaceous earth (as a carrier) 120 parts was treated at 10 atm. and 245° with 100 cu. m. water gas contg. CO<sub>2</sub> 4.7, CO 39.6, H<sub>2</sub> 49.8, CH<sub>4</sub> 0.1, and N<sub>2</sub> 6.3%. The effluent gas (CO<sub>2</sub> 29.2, CnHm 0.6, CO 18.5, H 33.6, CH<sub>4</sub> 3.3, and N 14.9%) was cooled to room temp. in order to condense the water formed and partly recycled together with fresh gas. The other part of the effluent gas was treated with the Co catalyst at 192° to give a gas contg. CO<sub>2</sub> 45.2, CnHm 1.1, CO 10.6, H<sub>2</sub> 12.7, CH<sub>4</sub> 8.0, and N<sub>2</sub> 22.7%. From 1 cu. m. of CO + H in the water gas, 162 g. of liquid products was obtained contg. paraffins 62, higher-boiling oils 20, and gasoline 18% by wt. Cf. C.A. 49, 3521b.

NCL 120; 1-03

CC 21 (Fuels and Coal Products)

L80 ANSWER 14 OF 14 HCA COPYRIGHT 2004 ACS on STN

52:47444 Original Reference No. 52:8513i,8514a Sulfur removal from carbon monoxide-**hydrogen mixtures**. Rottig, Walter; Hanisch, Franz (Ruhrchemie A.-G.). DE 906606 19540315 (Unavailable). APPLICATION: DE .

AB **S-contg. org. compds.** are removed from gas mixts. contg. CO and H in a 2-stage process. In the 1st stage, the S compds. are converted to H<sub>2</sub>S at 450° by means of an oxidized and sulfurized Ni catalyst on kieselguhr. After addn. of 0.65% O, the H<sub>2</sub>S-contg. gas is passed at 300° over a limestone catalyst, to which <2% Fe<sub>2</sub>O<sub>3</sub>, Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>, MgO, etc., has been added. The throughput is 500 l. gas/l. of catalyst/hr. After 650 hrs., the temp. is raised to 350°, after 200 hrs. to 400°, and after 4000 hrs. to 450°. Practically no H<sub>2</sub>S was found in the gas, and the S content was 0.38 g./100 cu. m.

IT **1333-74-0**, Hydrogen

(mixts. with CO, S removal from)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

NCL 26D; 8-04

CC 21 (Fuels and Coal Products)

IT **1333-74-0**, Hydrogen

(mixts. with CO, S removal from)

=> d his 181-

FILE 'HCA'

L81 62144 S VAPOR?(2A) (PRESS# OR PRESSUR?)  
L82 2865 S (L2 OR L3) AND L81  
L83 37 S L82 AND L13  
L84 13 S L82 AND L14  
L85 23 S L82 AND L15  
L86 0 S L82 AND L16  
L87 7 S L82 AND (L17 OR L25)  
L88 1 S L82 AND (L18 OR L26)  
L89 3 S L82 AND (L19 OR L24)  
L90 2 S (L83-L89) AND L55  
L91 0 S (L83-L89) AND (L20 OR L29)  
L92 1 S (L83-L89) AND (L47 OR L48 OR L49)  
L93 0 S (L83-L89) AND L68  
L94 3 S (L90-L93) NOT (L52 OR L53 OR L67 OR L77)  
L95 11 S (L87-L89) NOT (L52 OR L53 OR L67 OR L77)

=> d 194 1-3 cbib abs hitstr hitind

L94 ANSWER 1 OF 3 HCA COPYRIGHT 2004 ACS on STN

122:217741 Gas hydrates in ultrapurification of gases. 4. Effect of gas **mixture composition** on the conditions of formation of gas hydrates and water **vapor pressure** above their surface. Vorotyntsev, V. M.; Malyshev, V. M. (Inst. Khim. Vysokochist. Veshchestv, Nizhniy Novgorod, Russia). Vysokochistye Veshchestva (6), 89-93 (Russian) 1994. CODEN: VYVEEC. ISSN: 0235-0122. Publisher: Nauka.

AB The pressures for dissocn. of the mixed gas hydrates and water **vapor pressure** above their surface were calcd. for different conditions of hydrate formation and for gas mixts. that contain volatile inorg. hydrides using a spherical cell model to find the Langmuir consts. The components of a gas mixt. with the value of dissocn. pressure that is lower or higher than that of the main substance being purified may substantially change the conditions for hydrate formation, and in some cases to preclude their formation at the conditions used for purifn. Increase of the gas mixt. pressure due to addn. of the component not being condensed at the given temp. allows to considerably reduce the content of water in a mol. form.

IT 7783-07-5P, **Hydrogen selenide**

(gas mixt. contg.; effect of gas mixt. compn. on conditions of formation of gas hydrates in ultrapurifn. of gases)

RN 7783-07-5 HCA

CN Hydrogen selenide (H<sub>2</sub>Se) (6CI, 8CI, 9CI) (CA INDEX NAME)

H<sub>2</sub>Se

CC 49-5 (Industrial Inorganic Chemicals)  
IT 7439-90-9P, Krypton, preparation 7783-06-4P, **Hydrogen**  
sulfide, preparation **7783-07-5P, Hydrogen**  
selenide 7784-42-1P, Arsine 7803-51-2P, Phosphine (PH<sub>3</sub>)  
(**gas** mixt. contg.; effect of gas mixt. compn. on  
conditions of formation of gas hydrates in ultrapurifn. of gases)

L94 ANSWER 2 OF 3 HCA COPYRIGHT 2004 ACS on STN

102:117039 The stable isotope **composition** of Dead Sea waters.  
Gat, Joel R. (Isot. Dep., Weizmann Inst. Sci., Rehovot, Israel).  
Earth and Planetary Science Letters, 71(2), 361-76 (English) 1984.  
CODEN: EPSLA2. ISSN: 0012-821X.

AB Dead Sea waters are moderately enriched in 18O; the degree of  
enrichment constitutes a balance between the diln. by freshwater  
influx and the isotope fractionation which accompanies evaporative  
water loss and vapor exchange with the atm. moisture. Modeling of  
the seasonal cycle and long-term trends of  $\delta^{18}\text{O}$ , in response  
to the changes in the environmental parameters, show that the major  
control is exercised by the salinity of the surface waters, through  
its effect of the **vapor pressure** gradient  
between the lake's surface and the atm.; the (steady state) isotopic  
compn. of the more saline brines tends towards less enriched 18O  
values. This fact can explain the relatively high  $\delta^{18}\text{O}$  levels  
encountered in the Lisan formation, which was deposited from Lake  
Lisan, the less saline Pleistocene precursor of the Dead Sea.

IT **1333-74-0D**, isotopes, occurrence **7782-44-7D**,  
isotopes, occurrence  
(in waters, of Dead Sea)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

CC 53-11 (Mineralogical and Geological Chemistry)  
Section cross-reference(s): 61

IT **1333-74-0D**, isotopes, occurrence **7782-44-7D**,  
isotopes, occurrence  
(in waters, of Dead Sea)

L94 ANSWER 3 OF 3 HCA COPYRIGHT 2004 ACS on STN

54:647 Original Reference No. 54:89h-i,90a-e Enrichment of uranium isotopes by the method of gas centrifugation. Groth, Wilhelm; Beyerle, Konrad; Ihle, Hans; Murrenhoff, Alexander; Mann, Erich; Welge, Karl Heinz U.S. At. Energy Comm., AEC-tr-3412, 1-71 (Unavailable) 1958.

AB Sepn. and enrichment of U235 by thermal diffusion did not prove feasible because the coeff. for light and heavy UF6 is practically 0. An ultracentrifuge procedure, which appeared more favorable for heavier elements, was developed. The sepn. by this method is dependent only on the abs. mass difference and not on a mass ratio. The 1st centrifuge built was 40 cm. long, 12 cm. in diam., and operated at 60,000 r.p.m. Test runs with Xe and UF6 gave excellent results. A multiplication procedure was proposed by Harteck; i.e., the "rocking procedure," which improved sepn. by setting up a column action when the gas stream between 2 coupled centrifuges was pulsed. Best results (with continuous drawing off) were enrichment of 7% U234, equiv. to 5.2% U235. Larger centrifuges were built as production prototypes. These incorporated many mech. improvements and a unique **safety** device which permitted relatively light foundation supports. The rotor was suspended inside a stationary casing which absorbed the torsional impact of the rotor in case of failure. This energy was expended as friction through rotary connections in the casing baseplate. The rotor was 150 mm. outer diam., 8 mm. wall thickness, and 700 mm. long. First results in these centrifuges were below theoretical. This was attributed to convections and turbulences. To counteract this, the system was stabilized with up to 90% H. Subsequent sepns. of Xe, Kr, and H selenides were never below theoretical. In some cases, the primary theoretical value was found to be multiplied by 2 or 2.5. This multiplication was studied in the GeH4-H2 system as a function of initial pressure, drawing-off velocity, and compn. of mixt. Results indicated that this effect was due in part to a circulation flow set up in the H by drawing off enriched product from the axis of the rotor and in part to Coriolis forces. In expts. with U, with the lids of the centrifuge at different temps., a multiplication of 4.65 was observed. For U isotopes, rough ests. indicate that with longer rotors of 3.5 m. length, under optimum conditions, this method would give a sepn. cost/kg. U about 10% lower than diffusion methods. Such larger centrifuges are being built. The purification of UF6 for centrifuge feed was also studied. SiF4 and HF were removed by resublimation in vacuo, Thus, a raw product of 38 mm. Hg **vapor pressure** was refined to yield UF6 of 17.8 mm. Hg **vapor pressure** at 0° (**vapor pressures** of 16.9 to 20 mm. Hg at 0° have been reported for pure UF6). For larger quantities, a batch rectification under pressure was developed. UF6

with 16.9-17.0 mm. Hg **vapor pressure** was obtained by this latter method with over 99% yield. Perfluoridation of Necton-45 oil to obtain fractions with viscosity independent of temp. for centrifuge bearings was also studied. No such product could be obtained by vapor phase fluoridation over CoF<sub>3</sub>.

IT 7783-07-5, Hydrogen selenide  
(in selenium isotope sepn. by gas centrifugation)  
RN 7783-07-5 HCA  
CN Hydrogen selenide (H<sub>2</sub>Se) (6CI, 8CI, 9CI) (CA INDEX NAME)

H<sub>2</sub>Se

IT 7782-49-2, Selenium  
(isotopes of, sepn. by gas centrifugation)  
RN 7782-49-2 HCA  
CN Selenium (8CI, 9CI) (CA INDEX NAME)

Se

CC 3A (Nuclear Phenomena)  
IT 7783-07-5, Hydrogen selenide  
(in selenium isotope sepn. by gas centrifugation)  
IT 7440-56-4, Germanium 7440-61-1, Uranium 7440-63-3, Xenon  
7782-49-2, Selenium  
(isotopes of, sepn. by gas centrifugation)

=> d 195 1-11 ti

L95 ANSWER 1 OF 11 HCA COPYRIGHT 2004 ACS on STN  
TI **Vapor pressure** isotope effects of water studied  
by molecular orbital calculations

L95 ANSWER 2 OF 11 HCA COPYRIGHT 2004 ACS on STN  
TI Modeling of the diurnal variations of the atmosphere of Titan

L95 ANSWER 3 OF 11 HCA COPYRIGHT 2004 ACS on STN  
TI Oxygen and hydrogen isotope partitioning between water liquid and  
vapor at elevated temperatures

L95 ANSWER 4 OF 11 HCA COPYRIGHT 2004 ACS on STN  
TI Spinel film chemical vapor deposition apparatus

L95 ANSWER 5 OF 11 HCA COPYRIGHT 2004 ACS on STN  
TI Semiconductor device

- L95 ANSWER 6 OF 11 HCA COPYRIGHT 2004 ACS on STN  
TI The stable isotope composition of Dead Sea waters
- L95 ANSWER 7 OF 11 HCA COPYRIGHT 2004 ACS on STN  
TI Low-pressure flames of a number of **compounds containing sulfur** studied by the ESR method
- L95 ANSWER 8 OF 11 HCA COPYRIGHT 2004 ACS on STN  
TI Kinetic studies of high temperature combustion reactions of Be
- L95 ANSWER 9 OF 11 HCA COPYRIGHT 2004 ACS on STN  
TI Liquid products from carbonaceous materials
- L95 ANSWER 10 OF 11 HCA COPYRIGHT 2004 ACS on STN  
TI Siliconhydrides X. **Nitrogen-containing compounds**
- L95 ANSWER 11 OF 11 HCA COPYRIGHT 2004 ACS on STN  
TI Work of the Physikalisch-Technische Reichsanstalt in 1914